The Corporation of the City of Sault Ste. Marie

Regular Meeting of City Council

Agenda

Monday, June 13, 2022

4:30 pm

Council Chambers and Video Conference

Meetings may be viewed live on the City's YouTube channel
https://www.youtube.com/user/SaultSteMarieOntario

Pages

1. **Land Acknowledgement**

I acknowledge, with respect, that we are in Robinson-Huron Treaty territory, that the land on which we are gathered is the traditional territory of the Anishinaabe and known as Bawating. Bawating is the home of Garden River First Nation, Batchewana First Nation, the Historic Sault Ste. Marie Metis Council.

2. **Adoption of Minutes** 17 - 42

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the Minutes of the Regular Council Meeting of May 24, 2022 be approved.

3. **Questions and Information Arising Out of the Minutes and not Otherwise on the Agenda**

4. **Declaration of Pecuniary Interest**

5. **Approve Agenda as Presented**

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that the Agenda for June 13, 2022 City Council Meeting as presented be approved.

6. Proclamations/Presentations

6.1. 2021 Medal of Merit Award Presentation

Barbara Nolan

6.2. Queen Street Cruise

Gary Trembinski, Gary Trembinski Jr.

6.3. Marconi Cultural Event Centre – Marconi Meets World

Ashlyn McMillan

7. Communications and Routine Reports of City Departments, Boards and Committees – Consent Agenda

Mover Councillor P. Christian

Seconder Councillor M. Scott
Resolved that all the items listed under date June 13, 2022 – Agenda item 7 – Consent Agenda be approved as recommended.

7.1. Finance Committee – 2023 Budget Schedule

43 - 45

A report of the Chief Financial Officer and Treasurer is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that report of the Chief Financial Officer and Treasurer dated June 13, 2022 concerning 2023 Budget Schedule be received and that the recommendation of the Finance Committee for the 2023 operating and capital budget schedule be approved.

7.2. NG 911 – Netagen Managed Solution/Services

46 - 48

A report of the Manager of Information Technology is attached for the consideration of Council.

The relevant By-law 2022-112 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.3. Property Tax Appeals

49 - 50

A report of the Manager of Taxation is attached for the consideration of Council.

Mover Councillor S. Hollingsworth

Seconder Councillor C. Gardi

Resolved that the report of the Manager of Taxation dated June 13, 2022 concerning Property Tax Appeals be received and that the tax records be amended pursuant to sections 354 and 357 of the *Municipal Act* be approved.

7.4. Tender for Mausoleum Expansion – Phase XVI

51 - 55

A report of the Manager of Purchasing is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Manager of Purchasing dated June 13, 2022 be received and that the tender submitted by EllisDon Industrial Inc. for construction of the Mausoleum Expansion – Phase XVI at the tendered price of $1,760,000 plus HST, as requested by Cemeteries Division, Community Development and Enterprise Services, be approved;

Further that the CAO be authorized to countersign the tender recommendation of the City's consultant (IDEA Inc.); and

Further that IDEA Inc. be authorized to issue a letter of intent to EllisDon Industrial Inc. to commence mobilization of the project.

A By-law authorizing signature of the contract for this project will appear on a future Agenda.

7.5. Supply and Delivery of Soft Drink Concession Supplies RFP

56 - 57

A report of the Manager of Purchasing is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor M. Scott
Resolved that the report of the Manager of Purchasing dated June 13, 2022 be received and that the proposal submitted by PepsiCo Beverages for the supply and delivery of soft drink concession supplies for a period of three years with an option to renew for up to two 1-year periods be approved.

A By-law authorizing signature of the agreement will appear on a future Agenda

7.6. Tourism Development Fund Applications

58 - 62

A report of the Director of Tourism and Community Development is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor M. Scott
Resolved that the report of the Director of Tourism and Community Development dated June 13, 2022 concerning May 2022 Tourism

Development Fund Applications be received and that the recommendation of the Tourism Sault Ste. Marie Board of Directors to support the following five projects for the amounts listed below be approved:

1. Poutine Feast – $5,000
2. Queen Street Cruise – $5,000
3. Marconi Meets World – $10,000
4. Canadian Institute of Forestry 2022 Conference and AGM – $5,000
5. Forest the Canoe Adventure Bus – $15,000

7.7. Green Burials

63 - 70

A report of the Director of Community Services is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Director of Community Services dated June 13, 2022 concerning Green Burials be received as information.

7.8. Arts and Culture Assistance Grants Late Intake 2022

71 - 73

A report of the Manager of Recreation and Culture is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Manager of Recreation and Culture dated June 13, 2022 concerning Arts and Culture Assistance Grants Late Intake 2022 be received and that the following grants be approved:

1. Algoma Arts Festival Association – $11,512
2. Northern Ontario Latin Hispanic Association – $3,123
3. Sault Film Festival – $6,732
4. Over the Rainbow – $2,586
5. Sault Theatre Workshop – $3,259

7.9. Community Development Fund Green Initiatives Program Applications

74 - 81

A report of the Sustainability Coordinator is attached for the consideration of Council.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that the report of the Sustainability Coordinator dated June 13, 2022

concerning Green Initiatives Program applications be received and that the following applications be approved:

1. City of Sault Ste. Marie Stormwater Art Project – $3,355
2. YMCA Aeroponic Tower Garden Project – $4,051.05
3. Blue Mar 4 Change Shoreline Cleanup Project – $4,929.73

7.10. Miscellaneous Construction and Paving – Contract 2022-10E 82 - 83

A report of the Municipal Services Engineer is attached for the consideration of Council.

The relevant By-law 2022-125 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.11. Resurfacing Contract – Contract 2022-13E 84 - 85

A report of the Municipal Services Engineer is attached for the consideration of Council.

The relevant By-law 2022-126 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.12. Capital Road Spending Survey – Northern Municipalities 86 - 89

A report of the Director of Engineering is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Director of Engineering dated June 13, 2022 concerning Capital Road Spending Survey – Northern Municipalities be received as information.

7.13. Strategies for Managing Traffic Speed 90 - 92

A report of the Director of Engineering is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Director of Engineering dated June 13, 2022 concerning Strategies for Managing Traffic Speed be received and that Council support, in principle, a multi-tiered, holistic approach to managing traffic speed as outlined below:

1. Establishment of a Speeding Task Force with representation from Police Services, Public Works and Engineering Services Department and Clerk's Division (Communications);

2. Collection of data through various means during the calendar year;
3. Analysis of data by the Speeding Task Force to better define issues;
4. Development of a public education campaign; and
5. Reporting progress to Council.

7.14. Brock Street Road Closure – Extension 93 - 94

A report of the Director of Engineering is attached for the consideration of Council.

The relevant By-law 2022-111 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.15. Municipal Law and By-Law Enforcement Officers 95 - 96

A report of the Manager of Transit and Parking is attached for the consideration of Council.

The relevant By-laws 2022-114 and 2022-115 are listed under Agenda item 12 and will be read with all by-laws under that item.

7.16. Fire Service By-Law Updates 97 - 98

A report of the Fire Chief is attached for the consideration of Council.

The relevant By-laws 2022-109 and 2022-110 are listed under Agenda item 12 and will be read with all by-laws under that item.

7.17. Disposition of 15 Creery Avenue 99 - 101

A report of the Assistant City Solicitor/Senior Litigation Counsel is attached for the consideration of Council.

The relevant By-law 2022-121 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.18. Disposition of 97 Victoria Street 102 - 104

A report of the Assistant City Solicitor/Senior Litigation Counsel is attached for the consideration of Council.

The relevant By-law 2022-122 is listed under Agenda item 12 and will be read with all by-laws under that item.

7.19. Group Homes 105 - 110

A report of the Director of Planning and City Solicitor is attached for the consideration of Council.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that the report of the Director of Planning and the City Solicitor dated June 13, 2022 concerning the feasibility of enforcing minimum separation distances between group homes be received as information.

7.20. A-5-22-Z.OP – 865 Second Line East (Soo Auto) 111 - 112

A report of the Planner is attached for the consideration of Council.

Mover Councillor S. Hollingsworth
Seconder Councillor M. Scott
Resolved that the report of the Planner dated June 13, 2022 concerning A-5-22-Z.OP – 865 Second Line East (SooAuto) be received as information.

8. Reports of City Departments, Boards and Committees

8.1. Administration

8.2. Corporate Services

8.3. Community Development and Enterprise Services

8.3.1. Mill Market Relocation Update 113 - 118

A report of the Deputy CAO is attached for the consideration of Council.

8.4. Public Works and Engineering Services

8.5. Fire Services

8.6. Legal

8.6.1. Granting Access to Neighbouring Property – River Road 119 - 121

A report of the Solicitor/Prosecutor is attached for the consideration of Council.

The relevant By-law 2022-124 is listed under Agenda item 12 and will be read with all by-laws under that item.

8.7. Planning

8.8. Boards and Committees

9. Unfinished Business, Notice of Motions and Resolutions Placed on Agenda by Members of Council

9.1. Charging Infrastructure

Mover Councillor C. Gardi

Seconder Councillor L. Vezeau-Allen

Whereas the climate crisis has forced countries, regions and municipalities around the world to re-evaluate and implement certain measures to help mitigate the existential and catastrophic impacts that will be caused by the changing climate; and

Whereas one of the most recognized ways for society to battle the climate crisis is to transition away from fossil fuels, to eliminate as best as possible, the emission of greenhouse gases (GHG); and

Whereas according to Natural Resources Canada, transportation accounts for 25% of Canada's GHG emissions, and almost half of that comes from light duty trucks and cars; and

Whereas Canada has set a mandatory target for all passenger cars and light duty trucks to be zero-emission by 2035; and

Whereas communities in Canada should be deliberately planning for the transition to predominantly electric passenger vehicles over the next decade;

Now Therefore Be It Resolved that Council request that staff develop a charging infrastructure plan to be presented to Council for consideration that will advance local policies to accelerate charging infrastructure in the community, and to include possible changes to local building codes to ensure electric vehicle readiness/inclusion in future commercial, industrial and residential development within the municipality of Sault Ste. Marie.

9.2. Association of Municipalities of Ontario

Mover Councillor R. Niro

Seconder Councillor L. Vezeau-Allen

Whereas the Association of Municipalities of Ontario (AMO) is a critical voice for municipalities to communicate and collaborate with the Provincial government on policy matters; and

Whereas Councillor L. Dufour has invested significant effort on better policy addressing housing affordability, building quality, and innovative service models which have depended on Provincial cooperation;

Now Therefore Be It Resolved that Sault Ste. Marie City Council support Councillor Dufour's bid for election to the Large Urban Caucus of the AMO Board of Directors at the 2022 AMO annual general meeting.

9.3. Laneway Maintenance

Mover Councillor L. Dufour

Seconder Councillor L. Vezeau-Allen
Whereas City-owned and maintained laneways provide important access for properties immediately abutting them, for both owners and emergency vehicles; and

Whereas litter, discarded drug paraphernalia and a lack of lighting are common neighbourhood concerns regarding many laneways; and

Whereas Public Works does its best to respond to complaints in a reactive manner; and

Whereas the City of Sault Ste. Marie has a Downtown Security Pilot program with security vehicles patrolling some downtown laneways;

Now Therefore Be It Resolved that staff be requested to work with relevant partners to develop a proactive system to ensure that laneways are clean, maintained and well lit, not just in downtown but across all neighbourhoods, including the James Street neighbourhood of the City.

9.4. Pine Street Sidewalk Extension

Mover Councillor L. Vezeau-Allen

Seconder Councillor L. Dufour
Whereas the City of Sault Ste. Marie's long term strategic planning includes the incorporation of active transportation; and

Whereas the definition of active transportation encompasses all forms of human-powered travel including: walking, cycling, rollerblading, skiing, and canoeing; and

Whereas the City prioritizes the development of safe and enjoyable active transportation routes to encourage healthy lifestyles, decrease automobile dependency, and increase recreational tourism opportunities; and

Whereas multiple residents and visitors use the John Rowswell Hub Trail to access our many amenities, including both Bellevue Park and the adjacent marina; and

Whereas the trail system and marina are easily accessed via Pine Street; and

Whereas the sidewalk on Pine Street does not extend to the marina entrance; and

Whereas many pedestrians use the lower Pine Street route without the safety of a sidewalk;

Now Therefore Be It Resolved that appropriate staff be requested to report on the feasibility and costs of extension of this sidewalk to better support active transportation in our community.

10. Committee of the Whole for the Purpose of Such Matters as are Referred to it by the Council by Resolution

11. Adoption of Report of the Committee of the Whole

12. Consideration and Passing of By-laws

Mover Councillor P. Christian

Seconder Councillor M. Scott
Resolved that all By-laws under item 12 of the Agenda under date June be approved.

12.1. By-laws before Council to be passed which do not require more than a simple majority

12.1.1. By-law 2022-74 (Agreement) Downtown Plaza Construction 122 - 1017

Council Report was passed by Council resolution on May 2, 2022.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-74 being a by-law to to authorize the execution of the Agreement between the City and Avery Construction Limited for the construction of the Downtown Plaza be passed in open Council this 13th day of June, 2022.

12.1.2. By-law 2022-109 (Appointment) Deputy Fire Chief Mike Oliverio 1018 - 1018

A report from the Fire Chief is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-109 being a by-law to appoint Mike Oliverio as Deputy Chief Fire Operations, Training, and Logistics be passed in open Council this 13th day of June, 2022.

12.1.3. By-law 2022-110 (Appointment) Fire Prevention Officers 1019 - 1019

A report from the Fire Chief is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-110 being a by-law to appoint Paul Antonello, Dave Kochanowski, Naomi Thibault and Craig Genys as Fire Prevention Officers for the purpose of enforcing By-law 81-404 and By-law 2009-82 be passed in open Council this 13th day of June, 2022.

12.1.4. By-law 2022-111 (Temporary Street Closing) Amend 2022-31 Brock and Albert temporary closing 1020 - 1020

A report from the Director of Engineering is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-111 being a by-law to amend By-law 2022-31 being a by-law to permit the temporary closing of Brock Street between Albert Street East and the northerly laneway adjacent to Civic #181 is amended by extending the street closure to August 31, 2022 be passed in open Council this 13th day of June, 2022.

12.1.5. By-law 2022-112 (Agreement) Netagen Commander 911 Services 1021 - 1061

A report from the Manager of Information Services is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-112 being a by-law to authorize the execution of the Agreement between the City and Netagen Communication Technologies Inc. for the use of Netagen's Netagan Commander 911 services be passed in open Council this 13th day of June, 2022.

12.1.6. By-law 2022-113 (Agreement) NorthernTel Limited Partnership (Ontera) 1062 - 1070

Council Report was passed by Council resolution on May 2, 2022.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-113 being a by-law to authorize the execution of the Agreement between the City and NorthernTel Limited Partnership (doing business as Ontera) for the installation and maintenance of the service components required to provide Business Internet Services to the legal boundaries of the customer sites be passed in open Council this 13th day of June, 2022.

12.1.7. By-law 2022-114 (Parking) Amend By-law 90-305 Municipal Law Enforcement Officers 1071 - 1073

A report from the Manager Transit and Parking is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-114 being a by-law to appoint Municipal Law Enforcement Officers to enforce the by-laws on various private properties and to amend Schedule “A” to By-law 90-305 be passed in open Council this

13th day of June, 2022.

12.1.8. By-law 2022-115 (Parking) Amend By-law 93-165 Municipal By-law Officers 1074 - 1075

A report from the Manager of Transit and Parking is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-115 being a by-law to appoint by-law enforcement officers to enforce the by-laws of The Corporation of the City of Sault Ste. Marie be passed in open Council this 13th day of June, 2022.

12.1.9. By-law 2022-116 (Official Plan Amendment) 865 Second Line E (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson 1076 - 1076

Council Report was passed by Council resolution on June 6, 2022.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-116 being a by-law to adopt Amendment No. 240 to the Official Plan for the City of Sault Ste. Marie (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson, northern 95 metres of 865 Second Line East) be passed in open Council this 13th day of June, 2022.

12.1.10. By-law 2022-117 (Zoning) 865 Second Line E (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson) 1077 - 1079

A report from the Planner is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-117 being a by-law to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at the northern 95m of 865 Second Line East (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson) be passed in open Council this 13th day of June, 2022.

12.1.11. By-law 2022-118 (Development Control) 865 Second Line East (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson) 1080 - 1081

Council report was passed by Council resolution on June 6, 2022.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-118 being a by-law to designate the lands located at the northern 95 metres of 865 Second Line East an area of site plan control (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson) be passed in open Council this 13th day of June, 2022.

12.1.12. By-law 2022-119 (Official Plan Amendment) 1035 Wellington Street East, 189 and 185 Upton Road (Zion Evangelical Lutheran Church) 1082 - 1084

Council Report was passed by Council resolution on May 24, 2022.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-119 being a by-law to to adopt Amendment No. 239 to the Official Plan for the City of Sault Ste. Marie (Zion Evangelical Lutheran Church, 1035 Wellington Street East, 189 and 185 Upton Road) be passed in open Council this 13th day of June, 2022.

12.1.13. By-law 2022-120 (Zoning) 1035 Wellington Street East, 189 Upton Road and185 Upton Road (Zion Evangelical Lutheran Church) 1085 - 1087

Council Report was passed by Council resolution on May 24, 2022

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-120 being a by-law to to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at 1035 Wellington Street East, 189 Upton Road and 185 Upton Road (Zion Evangelical Lutheran Church) be passed in open Council this 13th day of June, 2022.

12.1.14. By-law 2022-121 (Property Sale) Part 15 Creery Avenue 1088 - 1089

A report from the Assistant City Solicitor/Senior Litigation Counsel is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-121 being a by-law to authorize the disposition of the City owned property described as PT PIN 31523-0147 (LT) PT PCL 9182 SEC AWS; BLK A PL M381 ST. MARY'S; S/T LT 109849; SAULT STE. MARIE being part of 15 Creery Avenue (30 feet running the length of the abutting property) in accordance with the City's policy for the disposition of land, to the abutting owner, specifically Chris Briel, for the amount of One Thousand One Hundred ($1,100) Dollars be passed in open Council this 13th day of June, 2022.

12.1.15. By-law 2022-122 (Property) 97 Victoria Street 1090 - 1091

A report from the Assistant City Solicitor/Senior Litigation Counsel is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-122 being a by-law to declare the City owned property legally described as PIN 31613-0179 (LT) LT 43 PL 58 AWENGE; SAULT STE. MARIE being civic 97 Victoria Street as surplus to the City's needs and to authorize the disposition of the said property be passed in open Council this 13th day of June, 2022.

12.1.16. By-law 2022-124 (Building) 327 River Road Neighbour Access 1092 - 1093

A report from the Solicitor/Prosecutor is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-124 being a by-law to to provide access for the maintenance of a single family dwelling located at 323 River Road be passed in open Council this 13th day of June, 2022.

12.1.17. By-law 2022-125 Avery Construction Limited (Contract 2022-10E) Miscellaneous Construction and Paving 1094 - 1096

A report from the Municipal Services Engineer is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-125 being a by-law to authorize the execution of the contract between the City and Avery Construction Limited for Miscellaneous Construction and Paving Contracts (Contract 2022-10E) be passed in open Council this 13th day of June, 2022.

12.1.18. By-law 2022-126 (Engineering) Ellwood Robinson (Contract 2022-13E) Resurfacing 1097 - 1099

A report from the Municipal Services Engineer is on the Agenda.

Mover Councillor S. Hollingsworth

Seconder Councillor M. Scott
Resolved that By-law 2022-126 being a by-law to authorize the execution of the contract between the City and Ellwood Robinson Incorporated for the Resurfacing Contract (Contract 2022-13E) be passed in open Council this 13th day of June, 2022.

12.2. By-laws before Council for FIRST and SECOND reading which do not require more than a simple majority

12.3. By-laws before Council for THIRD reading which do not require more than a simple majority

12.3.1. By-law 2022-108 (Street/Lane Closing) Downtown Plaza 1100 - 1103

Council Report was passed by Council resolution on May 24, 2022.

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that By-law 2022-108 being a by-law to stop up, close and authorize the conveyance of various streets/lanes in the Downtown Plaza be read a third time and passed in open Council this 13th day of June, 2022.

13. Questions By, New Business From, or Addresses by Members of Council Concerning Matters Not Otherwise on the Agenda

14. Closed Session

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that this Council move into closed session to discuss one item regarding a trade secret supplied in confidence to the municipality;

Further Be It Resolved that should the said closed session be adjourned, the Council may reconvene in closed session to discuss the same matters without the need for a further authorizing resolution.

(Municipal Act section 239(2)(i) a trade secret or scientific, technical, commercial, financial or labour relations information, supplied in confidence to the municipality or local board, which, if disclosed, could reasonably be expected to prejudice significantly the competitive position or interfere significantly with the contractual or other negotiations of a person, group of persons, or organization)

15. Adjournment

Mover Councillor P. Christian

Seconder Councillor C. Gardi
Resolved that this Council now adjourn.

REGULAR MEETING OF CITY COUNCIL

MINUTES

Tuesday, May 24, 2022
4:30 pm
Council Chambers and Video Conference

Present:	Mayor C. Provenzano, Councillor P. Christian, Councillor S. Hollingsworth, Councillor L. Dufour, Councillor L. Vezeau-Allen, Councillor M. Shoemaker, Councillor M. Bruni, Councillor R. Niro, Councillor C. Gardi, Councillor M. Scott
Absent:	Councillor D. Hilsinger
Officials:	M. White, R. Tyczinski, M. Zuppa (L. Girardi, T. Vair, K. Fields, S. Schell, P. Johnson, D. McConnell, B. Lamming, F. Coccimiglio, C. Rumiel, V. McLeod T. Vecchio, K. Fisher by video conference)

---

1. Land Acknowledgement

2. Adoption of Minutes

Moved by: Councillor M. Bruni
Seconded by: Councillor C. Gardi

Resolved that the Minutes of the Regular Council Meeting of May 2, 2022 be approved.

Carried

3. Questions and Information Arising Out of the Minutes and not Otherwise on the Agenda

4. Declaration of Pecuniary Interest

4.1 Councillor R. Niro – By-law 2022-94 (Official Plan Amendment 238) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Daughter resides within the notification area.

4.2 Councillor R. Niro – By-law 2022-95 (Zoning) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Daughter resides within the notification area.

4.3 Councillor R. Niro – By-law 2022-96 (Development Control) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Daughter resides within the notification area.

4.4 Councillor M. Shoemaker – By-law 2022-94 (Official Plan Amendment 238) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Applicant is a client of law firm.

4.5 Councillor M. Shoemaker – By-law 2022-95 (Zoning) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Applicant is a client of law firm.

4.6 Councillor M. Shoemaker – By-law 2022-96 (Development Control) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Applicant is a client of law firm.

5. Approve Agenda as Presented

Moved by: Councillor R. Niro
Seconded by: Councillor C. Gardi

Resolved that the Agenda for May 24, 2022 City Council Meeting as presented be approved.

Carried

6. Proclamations/Presentations

6.1 Hydrocephalus and Spina Bifida Awareness Month

6.2 Social Services Awareness Week

6.3 Menstrual Health Day

6.4 National Deafblind Awareness Month

6.5 Recreation and Parks Month

6.6 PUC Smartgrid

Robert Brewer, President and CEO and Kevin Bell, Vice President – Business Development were in attendance.

7. Communications and Routine Reports of City Departments, Boards and Committees – Consent Agenda

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that all the items listed under date May 24, 2022 – Agenda item 7 – Consent Agenda save and except Agenda item 7.20 be approved as recommended.

Carried

7.1 Hallowe'en Spirit Awards

The report of the Deputy City Clerk was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Deputy City Clerk dated May 24, 2022 concerning Hallowe'en Spirit Awards be received and that a Hallowe'en Spirit Awards program commence in 2023.

Carried

7.2 Travel Expenses of Council and Employees – By-law Amendment

The report of the Chief Financial Officer/Treasurer was received by Council.

The relevant By-law 2022-106 is listed under item 12 of the Minutes.

7.3 Listing and Marketing City-Owned Industrial Properties

The report of the Manager of Purchasing was received by Council.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Manager of Purchasing dated May 24, 2022 be received and that the proposal submitted by Century 21 Choice Realty Inc. for the provision of professional services for listing and marketing City-owned industrial properties on an as-required basis for a three year period (with the option for up to two additional years by mutual agreement) as required by Economic Development be approved.

Carried

7.4 Tenders for Equipment Purchase

The report of the Manager of Purchasing was received by Council.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Manager of Purchasing dated May 24, 2022 be received and that the tenders for the supply and delivery of various pieces of equipment be awarded as follows:

- One utility truck with crane, Commercial Truck Equipment – $148,795
- One trailer mounted portable generator, Toromont CAT – $141,109

for a total amount of $289,904 plus HST.

Carried

7.5 Downtown Trolley

The report of the Deputy CAO, Community Development and Enterprise Services was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Deputy CAO, Community Development and Enterprise Services dated May 24, 2022 concerning Downtown Trolley be received as information.

Carried

7.6 Northern Avenue at Sackville Road Intersection – Crossing Guard Update

The report of the Director of Community Services was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Director of Community Services dated May 24, 2022 concerning Northern Avenue at Sackville Road Intersection – Crossing Guard Update be received and that a crossing guard be maintained at Northern Avenue at Sackville Road intersection. (If there is a significant drop in utilization in the future staff are authorized to remove the guard in alignment with Engineering's previous recommendation to Council.)

Carried

7.7 Heritage Property Tax Rebate Program – 1048 Queen Street East

The report of the Manager of Recreation and Culture was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Manager of Recreation and Culture dated May 24, 2022 concerning Heritage Property Tax Rebate Program – 1048 Queen Street East be received and that the recommendation of the Sault Ste. Marie Municipal Heritage Committee that 1048 Queen Street East be enrolled in the Heritage Property Tax Rebate Program be approved.

Carried

7.8 Best for Kids Program – Reserve Funds

The report of the Manager of Recreation and Culture was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Manager of Recreation and Culture dated May 24, 2022 concerning Best for Kids Program – Reserve Funds be received and that an allocation of $2,600 to be used to purchase program equipment be approved.

Carried

7.9 St. Marys River Heritage Walk Project Update

The report of the Manager of Recreation and Culture was received by Council.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Manager of Recreation and Culture dated May 24, 2022 concerning St. Marys River Heritage Walk Project Update be received and that $12,800 be allocated from the Asset Management Reserve.

Carried

7.10 Ermatinger Clergue National Historic Site – Annual Report – 2021 Operations

The report of the Curator of the Ermatinger Clergue National Historic Site was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Curator of the Ermatinger Clergue National Historic Site dated May 24, 2022 concerning Annual Report – 2021 Operations be received as information.

Carried

7.11 Passchendaele Lane Construction

The report of the Municipal Services Engineer was received by Council.

The relevant By-laws 2022-104 and 2022-105 are listed under item 12 of the Minutes.

7.12 Central Creek Aqueduct Repair 2022

The report of the Municipal Services Engineer was received by Council.

The relevant By-laws 2022-99 and 2022-101 are listed under item 12 of the Minutes.

7.13 Bloor Street West Reconstruction

The report of the Municipal Services Engineer was received by Council.

The relevant By-laws 2022-97 and 2022-98 are listed under item 12 of the Minutes.

7.14 Biosolids Management Plan Notice of Addendum

The report of the Land Development and Environmental Engineer was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Land Development and Environmental Engineer dated May 24, 2022 concerning Biosolids Management Plan Notice of Addendum be received that the Notice of Addendum be issued.

Carried

7.15 MacDonald Avenue Drainage Improvements

The report of the Land Development and Environmental Engineer was received by Council.

The relevant By-law 2022-102 and 2022-103 are listed under item 12 of the Minutes.

7.16 Landfill Operations and Monitoring 2021 – Environmental Monitoring Committee

The report of the Land Development and Environmental Engineer was received by Council.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Land Development and Environmental Engineer dated May 24, 2022 concerning Landfill Operations and Monitoring 2021 – Environmental Monitoring Committee be received as information.

Carried

7.17 2022 Ditching Program

The report of the Director of Public Works was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Director of Public Works dated May 24, 2022 concerning 2022 Ditching Program be received as information.

Carried

7.18 Street and Lane Closings Downtown Plaza

The report of the Assistant City Solicitor/Senior Litigation Counsel was received by Council.

The relevant 2022-107 and 2022-108 are listed under item 12 of the Minutes.

7.19 Rental Housing Incentive Program 18 – 352 Northern Avenue

The report of the Senior Planner was received by Council.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Senior Planner dated May 24, 2022 concerning Rental Housing Incentive Program 18 – 352 Northern Avenue be received and that Council authorize a four-year incremental tax grant (75%, 75%, 50%, 25%) for the proposed 58 unit development at 352 Northern Avenue, subject to:

1. That the municipal tax grant applies only to the increase in assessment resulting from new construction; and
2. After the grant program is completed, full municipal taxes will apply.

Carried

7.21 Korah Relay for Life

Correspondence from the Korah Relay for Life Committee was received by Council.

The relevant By-law 2022-90 is listed under item 12 of the Minutes.

7.22 Huron Central Railway – Updated Letter of Support

The report of the CAO was received by Council.

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that the report of the CAO dated May 24, 2022 concerning Huron Central Railway – Updated Letter of Support be received and that an updated Letter of Support for HCR's application to the Federal Government be issued.

Carried

8. Reports of City Departments, Boards and Committees

8.1 Administration

8.2 Corporate Services

8.3 Community Development and Enterprise Services

8.4 Public Works and Engineering Services

8.5 Fire Services

8.6 Legal

8.7 Planning

8.7.1 A-3-22-Z.OP 1035 Wellington Street East, 189 Upton Road and 185 Upton Road (Amended) Zion Evangelical Lutheran Church

The report of the Planner was received by Council.

Elaine Brown and Kirsten Bursche were in attendance on behalf of the Applicant.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Planner dated May 24, 2022 concerning Official Plan and Rezoning Application A-3-22-Z.OP be received and that Council:

Approve Official Plan Amendment #239 by way of a notwithstanding clause to permit up to 325m^2 of office space on the subject property (1035 Wellington Street East, 185 and 189 Upton Road);

Rezone the subject property (1035 Wellington Street East, 185 and 189 Upton Road) from Single-Detached Residential Zone (R2) to Single-Detached Residential Zone (R2.S) with a special exception to, in addition to the uses permitted in a Single-Detached Residential Zone (R2):

1. Permit up to 325 square metres of office space;
2. Reduce the landscaped open space requirement from 30% to 25%;
3. Permit parking spaces to be located in a required exterior side yard within 50 metres of the southerly lot line;

4. Exempt the required 15 parking spaces associated with the office space from surface treatment requirements; and
5. Reduce the required number of barrier free parking spaces from 2 to 0 for office space.

And that the Legal Department be requested to prepare the necessary by-law(s) to effect the same.

	For	Against	Conflict	Absent
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker	X			
Councillor M. Bruni	X			
Councillor R. Niro	X			
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**10**	**0**	**0**	**1**

Carried

8.7.2 A-5-22-Z.OP 865 Second Line East (Soo Auto)

The report of the Planner was received by Council.

Chris Frees and Candy Johnson were in attendance on behalf of the Applicant

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that the report of the Planner dated May 24, 2022 concerning Official Plan and Rezoning Application A-5-22-Z.OP be received and that Council:

Redesignate the northern 95 metres of 865 Second Line East from Residential to Commercial on Land Use Schedule C by approving Official Plan Amendment #240;

Rezone the northern 95 metres of 865 Second Line East from General Commercial Zone (C4) to General Commercial Zone (C4.S) with a special exception to reduce the required landscaped open space from 50% to 30% for the required exterior side yard only;

And that the northern 95 metres of 865 Second Line East be deemed subject to site plan control as per section 41 of the *Planning Act*;

And that the Legal Department be requested to prepare the necessary by-law(s) to effect the same.

	For	Against	Conflict	Absent
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker	X			
Councillor M. Bruni	X			
Councillor R. Niro	X			
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**10**	**0**	**0**	**1**

Carried

7.20 Rental Housing Incentive Program – Two Year Extension to 2024

The report of the Planning Director was received by Council.

The relevant By-law 2022-93 is listed under item 12 of the Minutes.

8.8 Boards and Committees

9. Unfinished Business, Notice of Motions and Resolutions Placed on Agenda by Members of Council

9.1 Group Homes

Moved by: Councillor P. Christian
Seconded by: Councillor S. Hollingsworth

Whereas group homes play an important role in providing care and treatment for their clients; and

Whereas these homes are staffed by trained professionals who deal with clients on an ongoing basis; and

Whereas group home staff are faced with challenging situations that, from time to time, require external support from municipal emergency services; and

Whereas these situations will occasionally disrupt the day-to-day lives of local residents and create occasional safety concerns for both clients and neighbours alike; and

Whereas some municipalities in Ontario have by-laws that create a minimum distance between group homes in an attempt to mitigate these situations;

Now Therefore Be It Resolved that staff be requested to research the creation of a by-law that recognizes the need for group homes in our community and establishes a buffer between them and report back to Council on June 13, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker	X			
Councillor M. Bruni	X			
Councillor R. Niro	X			
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**10**	**0**	**0**	**1**
				Carried

10. Committee of the Whole for the Purpose of Such Matters as are Referred to it by the Council by Resolution

11. Adoption of Report of the Committee of the Whole

12. Consideration and Passing of By-laws

Moved by: Councillor M. Bruni
Seconded by: Councillor M. Shoemaker

Resolved that all By-laws under item 12 of the Agenda under date May 24, 2022 save and except By-laws 2022-94, 2022-95 and 2022-96 be approved.

Carried

12.1 By-laws before Council to be passed which do not require more than a simple majority

12.1.1 By-law 2022-90 (Regulation Noise) Korah Relay for Life

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-90 being a by-law to amend Noise Control By-law 80-200 by-law to allow for an exemption from the Noise Control By-law to accommodate a fundraising event held by the Korah Relay for Life team from 7:00 p.m. on June 9, 2022 to 7:00 a.m. on June 10, 2022 be passed in open Council this 24th day of May, 2022.

Carried

12.1.2 By-law 2022-91 (Agreement) Mill Market Relocation Brock Street

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-91 being a by-law to authorize the execution of the Agreement between the City and MGP Architects Engineer Inc. for the relocation of the Mill Market to 73 Brock Street be passed in open Council this 24th day of May, 2022.

Carried

12.1.3 By-law 2022-92 (Agreement) Sault Lock Tours Inc.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-92 being a by-law to authorize the execution of the Agreement between the City and Sault Lock Tours Inc. for dock rental space at the Roberta Bondar Park be passed in open Council this 24th day of May, 2022.

Carried

12.1.8 By-law 2022-97 (Engineering) Reconstruction Bloor Street West (Contract 2022-6E)

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-97 being a by-law to authorize the execution of the contract between the City and Pioneer Construction Inc. for the reconstruction of Bloor Street West from Lyons Avenue to Patrick Street (Contract 2022-6E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.9 By-law 2022-98 (Temporary Street Closing) Bloor Street West

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-98 being a by-law to permit the temporary closing of Bloor Street West from Lyons Avenue to Patrick Street from May 30, 2022 to November 30, 2022 to allow for the reconstruction of Bloor Street West from Lyons Avenue to Patrick Street be passed in open Council this 24th day of May, 2022.

Carried

12.1.10 By-law 2022-99 (Engineering) Central Creek West Aqueduct Repairs

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-99 being a by-law to authorize the execution of the contract between the City and EllisDon Industrial Inc. for the 2022 Central Creek West Aqueduct repairs (Contract 2022-9E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.11 By-law 2022-101 (Temporary Street Closing) Metzger Street and McAllen Street

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-101 being a by-law to permit the temporary closing of Metzger Street and McAllen Street at Central Street from May 30, 2022 to November 30, 2022 to allow for the 2022 Central Creek Aqueduct repairs be passed in open Council this 24th day of May, 2022.

Carried

12.1.12 By-law 2022-102 (Engineering) MacDonald Ave Drainage Improvements (Contract 2022-8E)

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-102 being a by-law to authorize the execution of the contract between the City and Trimount Construction Group Inc. for the MacDonald Avenue Drainage Improvements (Contract 2022-8E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.13 By-law 2022-103 (Temporary Street Closing) MacDonald Avenue

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-103 being a by-law to permit the intermittent temporary closing of MacDonald Avenue from May 30, 2022 to October 31, 2022 be passed in open Council this 24th day of May, 2022.

Carried

12.1.14 By-law 2022-104 (Engineering) Passchendaele Lane Construction

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-104 being a by-law to authorize the execution of the Contract between the City and Pioneer Construction Inc. for the Passchendaele Lane construction (Contract 2022-E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.15 By-law 2022-105 (Temporary Street Closing) Intersections Northern Avenue East, Panoramic Drive, Princeton Drive with Passchendaele Lane

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-105 being a by-law to permit the intermittent temporary closing of the intersections of Northern Avenue East, Panoramic Drive and Princeton Drive with the proposed Passchendaele Lane from May 30, 2022 to November 30, 2022 to allow for the Passchendaele Lane construction be passed in open Council this 24th day of May, 2022.

Carried

12.1.16 By-law 2022-106 (Administration) Travel Expenses

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-106 being a by-law to amend By-law 2015-147 (being a by-law to authorize payment of membership fees, registration fees and travel expenses incurred by members of Council and employees of the Corporation while travelling on the business of the Corporation) be passed in open Council this 24th day of May, 2022.

Carried

12.1.17 By-law 2022-107 (Street/Lane Assumptions) Downtown Plaza

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-107 being a by-law to assume for public use and establish as public streets various parcels of land be passed in open Council this 24th day of May, 2022.

Carried

12.1.18 By-law 2022-108 (Street/Lane Closing) Downtown Plaza

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-108 being a by-law to stop up, close and authorize the conveyance of various streets/lanes in the Downtown Plaza be passed in open Council this 24th day of May, 2022.

Carried

12.1.4 By-law 2022-93 (Planning) Rental Housing Community Improvement Plan

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-93 being a by-law to extend the Rental Housing Community Improvement Plan for an additional two years be passed in open Council this 24th day of May, 2022.

	For	Against	Conflict	Absent
Mayor C. Provenzano	X			
Councillor P. Christian	X			

Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker	X			
Councillor M. Bruni	X			
Councillor R. Niro	X			
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**10**	**0**	**0**	**1**

Carried

12.1.5 By-law 2022-94 (Official Plan Amendment 238) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-94 being a by-law to adopt Amendment No. 238 to the Official Plan for the City of Sault Ste. Marie (Cesar Developments Inc. c/o Anthony Cesario, southernly 74 metres of 522 Allen's Side Road) be passed in open Council this 24th day of May, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X

Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

12.1.6 By-law 2022-95 (Zoning) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-95 being a by-law to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at the southernly 74 metres of 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario) be passed in open Council this 24th day of May, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			

Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

12.1.7 By-law 2022-96 (Development Control) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-96 being a by-law to designate the lands located at the southernly 74 metres of 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario) subject to site plan control be passed in open Council this 24th day of May, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

12.2 By-laws before Council for FIRST and SECOND reading which do not require more than a simple majority

12.3 By-laws before Council for THIRD reading which do not require more than a simple majority

12. Consideration and Passing of By-laws

12.1 By-laws before Council to be passed which do not require more than a simple majority

12.1.4 By-law 2022-93 (Planning) Rental Housing Community Improvement Plan

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-93 being a by-law to extend the Rental Housing Community Improvement Plan for an additional two years be passed in open Council this 24th day of May, 2022.

	For	Against	Conflict	Absent
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker	X			
Councillor M. Bruni	X			
Councillor R. Niro	X			
Councillor C. Gardi	X			
	X			
Councillor M. Scott				
Results	**10**	**0**	**0**	**1**

Carried

12.1 By-laws before Council to be passed which do not require more than a simple majority

12.1.1 By-law 2022-90 (Regulation Noise) Korah Relay for Life

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-90 being a by-law to amend Noise Control By-law 80-200 by-law to allow for an exemption from the Noise Control By-law to accommodate a fundraising event held by the Korah Relay for Life team from 7:00 p.m. on June 9, 2022 to 7:00 a.m. on June 10, 2022 be passed in open Council this 24th day of May, 2022.

Carried

12.1.2 By-law 2022-91 (Agreement) Mill Market Relocation Brock Street

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-91 being a by-law to authorize the execution of the Agreement between the City and MGP Architects Engineer Inc. for the relocation of the Mill Market to 73 Brock Street be passed in open Council this 24th day of May, 2022.

Carried

12.1.3 By-law 2022-92 (Agreement) Sault Lock Tours Inc.

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-92 being a by-law to authorize the execution of the Agreement between the City and Sault Lock Tours Inc. for dock rental space at the Roberta Bondar Park be passed in open Council this 24th day of May, 2022.

Carried

12.1.8 By-law 2022-97 (Engineering) Reconstruction Bloor Street West (Contract 2022-6E)

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-97 being a by-law to authorize the execution of the contract between the City and Pioneer Construction Inc. for the reconstruction of Bloor Street West from Lyons Avenue to Patrick Street (Contract 2022-6E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.9 By-law 2022-98 (Temporary Street Closing) Bloor Street West

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-98 being a by-law to permit the temporary closing of Bloor Street West from Lyons Avenue to Patrick Street from May 30, 2022 to November 30, 2022 to allow for the reconstruction of Bloor Street West from Lyons Avenue to Patrick Street be passed in open Council this 24th day of May, 2022.

Carried

12.1.10 By-law 2022-99 (Engineering) Central Creek West Aqueduct Repairs

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-99 being a by-law to authorize the execution of the contract between the City and EllisDon Industrial Inc. for the 2022 Central Creek West Aqueduct repairs (Contract 2022-9E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.11 By-law 2022-101 (Temporary Street Closing) Metzger Street and McAllen Street

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-101 being a by-law to permit the temporary closing of Metzger Street and McAllen Street at Central Street from May 30, 2022 to November 30, 2022 to allow for the 2022 Central Creek Aqueduct repairs be passed in open Council this 24th day of May, 2022.

Carried

12.1.12 By-law 2022-102 (Engineering) MacDonald Ave Drainage Improvements (Contract 2022-8E)

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-102 being a by-law to authorize the execution of the contract between the City and Trimount Construction Group Inc. for the MacDonald Avenue Drainage Improvements (Contract 2022-8E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.13 By-law 2022-103 (Temporary Street Closing) MacDonald Avenue

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-103 being a by-law to permit the intermittent temporary closing of MacDonald Avenue from May 30, 2022 to October 31, 2022 be passed in open Council this 24th day of May, 2022.

Carried

12.1.14 By-law 2022-104 (Engineering) Passchendaele Lane Construction

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-104 being a by-law to authorize the execution of the Contract between the City and Pioneer Construction Inc. for the Passchendaele Lane construction (Contract 2022-E) be passed in open Council this 24th day of May, 2022.

Carried

12.1.15 By-law 2022-105 (Temporary Street Closing) Intersections Northern Avenue East, Panoramic Drive, Princeton Drive with Passchendaele Lane

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-105 being a by-law to permit the intermittent temporary closing of the intersections of Northern Avenue East, Panoramic Drive and Princeton Drive with the proposed Passchendaele Lane from May 30, 2022 to November 30, 2022 to allow for the Passchendaele Lane construction be passed in open Council this 24th day of May, 2022.

Carried

12.1.16 By-law 2022-106 (Administration) Travel Expenses

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-106 being a by-law to to amend By-law 2015-147 (being a by-law to authorize payment of membership fees, registration fees and travel expenses incurred by members of Council and employees of the Corporation while travelling on the business of the Corporation) be passed in open Council this 24th day of May, 2022.

Carried

12.1.17 By-law 2022-107 (Street/Lane Assumptions) Downtown Plaza

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-107 being a by-law to assume for public use and establish as public streets various parcels of land be passed in open Council this 24th day of May, 2022.

Carried

12.1.18 By-law 2022-108 (Street/Lane Closing) Downtown Plaza

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that By-law 2022-108 being a by-law to stop up, close and authorize the conveyance of various streets/lanes in the Downtown Plaza be passed in open Council this 24th day of May, 2022.

Carried

12.1.5 By-law 2022-94 (Official Plan Amendment 238) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-94 being a by-law to adopt Amendment No. 238 to the Official Plan for the City of Sault Ste. Marie (Cesar Developments Inc. c/o Anthony Cesario, southernly 74 metres of 522 Allen's Side Road) be passed in open Council this 24th day of May, 2022.

	For	Against	Conflict	Absent
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X

Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

12.1.6 By-law 2022-95 (Zoning) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-95 being a by-law to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at the southernly 74 metres of 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario) be passed in open Council this 24th day of May, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			

Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

12.1.7 By-law 2022-96 (Development Control) 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario)

Councillor R. Niro declared a conflict on this item. (Daughter resides within the notification area.)

Councillor M. Shoemaker declared a conflict on this item. (Applicant is a client of law firm.)

Moved by: Councillor M. Bruni
Seconded by: Councillor S. Hollingsworth

Resolved that By-law 2022-96 being a by-law to designate the lands located at the southernly 74 metres of 522 Allen's Side Road (Cesar Developments Inc. c/o Anthony Cesario) subject to site plan control be passed in open Council this 24th day of May, 2022.

	For	**Against**	**Conflict**	**Absent**
Mayor C. Provenzano	X			
Councillor P. Christian	X			
Councillor S. Hollingsworth	X			
Councillor L. Dufour	X			
Councillor L. Vezeau-Allen	X			
Councillor D. Hilsinger				X
Councillor M. Shoemaker			**X**	
Councillor M. Bruni	X			
Councillor R. Niro			**X**	
Councillor C. Gardi	X			
Councillor M. Scott	X			
Results	**8**	**0**	**2**	**1**

Carried

13. Questions By, New Business From, or Addresses by Members of Council Concerning Matters Not Otherwise on the Agenda

14. Closed Session

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that this Council move into closed session to consider two items concerning the proposed disposition of property;

Further Be It Resolved that should the said closed session be adjourned, the Council may reconvene in closed session to discuss the same matter without the need for a further authorizing resolution.

(Municipal Act section 239(2)(c) a proposed or pending acquisition or disposition of land by the municipality or local board)

Carried

15. Adjournment

Moved by: Councillor R. Niro
Seconded by: Councillor M. Shoemaker

Resolved that this Council now adjourn.

Carried

_____

Mayor

_____

City Clerk

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Shelley J Schell, CPA CA Chief Financial Officer & Treasurer
DEPARTMENT:	Corporate Services
RE:	Finance Committee-2023 Budget Schedule

Purpose
The purpose of this report is to seek Council approval of the recommendation of the Finance Committee for the 2023 Budget Schedule.

Background
The Finance Committee met on May 18, 2022. The Budget Schedule (attached) was reviewed. The following recommendation is provided for Council approval.

Moved By: P. Collett
Seconded By: A. Alkonsani

The Finance Committee has reviewed the timetables for the 2023 Operating and Capital Budgets and recommends approval to Council the deliberation schedule.

Analysis
Not applicable.

Financial Implications
There are no direct financial implications associated with the budget schedule.

Strategic Plan / Policy Impact
This is an operational matter not articulated in the Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that report of the Chief Financial Officer and Treasurer dated June 13, 2022 concerning Finance Committee 2023 Budget Schedule be received and that the recommendation of the Finance Committee for the 2023 Operating and Capital Budget schedule be approved.

Respectfully submitted,

Shelley J. Schell, CPA, CA
Chief Financial Officer/Treasurer
705.759.5355
s.schell@cityssm.on.ca

THE CORPORATION OF THE CITY OF SAULT STE MARIE
2023 BUDGET SCHEDULE
OPERATING & CAPITAL BUDGET

Election year. New Council first meeting is November 21, 2022. Preliminary budget will be moved to January, 2023 from end of Novem
Deliberations will be moved to February, 2023 from early December

	Council/Committee Date
Capital budget evaluation matrix to Finance Committee for review/recommendation	June 8 , 2022
Outside agency & levy board presentations	January 23, 2023
Preliminary Budget to Council - Operating & Capital User Fees approval	January 30, 2023
Budget deliberation	February 13 & 14, 2023

Post Budget Approval

Tax Policy Analysis, Options and Tax Rates	April 2023, or earlier if available
Capping Options (date is dependent upon release of Education Rates by Province)	April 2023, or earlier if available

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Frank Coccimiglio, Manager of Information Technology
DEPARTMENT:	Corporate Services
RE:	NG-911 Netagen Managed Solution/Services

Purpose

This report has been prepared for your information and consideration, concerning the execution of the contracts between Netagen Corporation and the City of Sault Ste. Marie for the implementation of an all-in-one fully managed “on-premise” NG-911 solution managed by the Sault Ste. Marie Police Services..

Background

Sault Ste. Marie Police Services is the current Primary Public Safety Answering Point (PPSAP) operator for the Sault Ste. Marie and Algoma Region and provides 9-1-1 call centre services for all emergency calls made throughout the region.

All PPSAPs are required by the federal government to upgrade their systems to meet Next Generation 911 capabilities and decommission existing services. Sault Ste. Marie Police Services has been diligently working on acquiring an industry leading solution meeting all regulatory standards trying to meet or exceed all the deadlines set by CRTC. All PPSAP operators are mandated to meet the NG911 standards no later than March 31, 2024 at which time the legacy systems will be disconnected.

The CRTC is responsible for regulating the telecommunications service providers who provide the telecommunication networks across Canada to direct and connect 9-1-1 emergency calls to emergency call centres. The CRTC mandated that all telecommunication providers update their networks in order to provide Next Generation 9-1-1 (NG911) voice, video and text messaging services throughout Canada.

NG911 automatically provides the 9-1-1 operator with the phone number and address or location of the caller. NG911 will also allow 9-1-1 callers to interact with 9-1-1 call centres using new and innovative services such as real time chat, texting to 9-1-1 services, and transmitting photos, videos, and medical records.

Analysis
In order to address the new NG911 requirements and to meet the deadlines set by CRTC, City Police Services along with the Fire Department and Information Technology have been actively working on sourcing out the best managed on-premise (on-prem) system that is available today for deployment.

The Netagen Commander 911, provides an all-in-one NG911 solution that meets and exceeds NENAi3 standards for Canadian PSAPs. Netagen's Commander 911 designed specifically for Canadian PSAPs, has quickly become the benchmark for meeting the NG911 standards deployed in Canada providing a solution that is:

- Fully managed on-site solution located at the Police Services building with a backup site at the main Firehall.
- Integrated with both the Police Services Computer Aided Dispatch (CAD) system and the Fire Services Crysis dispatch and recording system.
- 24x7 remote support, patch management, cybersecurity and operational monitoring.
- All data resides in Canada
- Proven system deployed in other municipalities across Canada.

Financial Implications
The total monthly fees for the Netegan managed on-prem solution is $24,965/month over a sixty-month term plus a one-time contract initiation of $25,000 for a project total of $1,497,790. 2022 costs will be funded from the Asset Management reserve utilizing the one-time funding allocation transferred from the 2022 Police Services budget. Funding for the remaining term will handled through on operating level increase to the levy in 2023.

Strategic Plan / Policy Impact
This service is linked to Delivery of Excellent Customer Service as listed in the Service Delivery Focus area of the Corporate Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Manager of Information Technology dated 2022 06 13 be received and the recommendation that Council approve the execution of By-Law 2022-112 for the provision of the Netagen NG911 solution/services for a period of five (5) years.

Respectfully submitted,

Frank F. Coccimiglio

Manager of Information Technology
705-759-5303
f.coccimiglio@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Lisa Petrocco, CPA, CGA Manager of Taxation
DEPARTMENT:	Corporate Services
RE:	Property Tax Appeals

Purpose
Staff is seeking Council approval of property tax appeals as required pursuant to Sections 354 and 357 of the *Municipal Act*.

Background
A listing of applications received for adjustment of realty taxes pursuant to Sections 354 and 357 of the *Municipal Act* is attached to this report.

Analysis
The Municipal Property Assessment Corporation has recommended the amount of the assessment to be adjusted.

Financial Implications
There is an annual budget allocation for tax write-offs. The decreased revenue of $8,989.16 can be accommodated within the existing budget allocation.

Strategic Plan / Policy Impact
Not applicable.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Manager of Taxation dated June 13, 2022 concerning Property Tax Appeals be received and that the recommendation that the tax records be amended pursuant to Sections 354 and 357 of the *Municipal Act* be approved.

Respectfully submitted,

Lisa Petrocco, CPA, CGA
Manager of Taxation
705.541.7065
l.petrocco@cityssm.on.ca

APPLICATION TO COUNCIL TO CANCEL OR REFUND PROPERTY TAXES PURSUANT TO SECTION 357 OF THE MUNICIPAL ACT, 2001

THE CORPORATION OF THE CITY OF SAULT STE. MARIE
PROPERTY TAX APPEALS

DATE: 2022 06 13

ROLL #	PROPERTY ADDRESS	PERSON ASSESSED		TAX CLASS	REASON	APPEAL NO.	TAXES	INTEREST	TOTAL
						2021			
020-038-182-00	00046 GRACE ST	GOODSHIP, KENNETH CHARLES	GAUTHIER, LIONEL MATTHEW	RT	D(i)	21-047	(458.58)	(28.66)	(487.24)
020-038-182-00	00046 GRACE ST	GOODSHIP, KENNETH CHARLES	GAUTHIER, LIONEL MATTHEW	RT	D(i)	21-048	(93.33)	(5.83)	(99.16)
020-042-220-00	00516 BAY ST	SAULT STE. MARIE CITY		CT>E	C	21-049	(126.59)	(66.15)	(192.74)
040-009-004-00	00540 JOHN ST	PIETARINEN, MELISSA		RT	D(i)	21-050	(142.93)	(8.93)	(151.86)
040-021-151-00	00293 BAY ST	ALGOMA CENTRAL PROPERTIES INC		CT/ST	D(iI)	21-051		Assessment Confirmed	
050-013-037-00	00447 DOUGLAS ST	DUNSEATH, ROBERT NEIL	DUNSEATH, DEBBIE LOU	CT/RT>RT	A	21-052	(451.87)	-	(451.87)
						2022			-
010-070-113-00	00206 DACEY RD	HURMANN CONTRACTING INC		RT	D(i)	2022-001	(1,695.73)	(30.77)	(1,726.50)
020-038-182-00	00046 GRACE ST	GOODSHIP, KENNETH CHARLES	GAUTHIER, LIONEL MATTHEW	RT	D(i)	2022-002	(774.83)	(13.18)	(788.01)
020-042-220-00	00516 BAY ST	SAULT STE. MARIE CITY		CT>E	C	2022-003	(128.62)	(2.58)	(131.20)
020-045-026-00	00915 QUEEN ST E	2836295 ONTARIO INC.		CT>RT	A	2022-004	(2,878.60)	(29.42)	(2,908.02)
040-009-004-00	00540 JOHN ST	PIETARINEN, MELISSA		RT	D(i)	2022-005	(148.37)	(2.47)	(150.84)
050-013-037-00	00447 DOUGLAS ST	DUNSEATH, ROBERT NEIL	DUNSEATH, DEBBIE LOU	CT/RT>RT	A	2022-006	(452.03)	(2.74)	(454.77)
050-013-168-00	00312 KORAH RD	VIAU, JOANNE JOCELYNE		CT/RT	A	2022-007		Assessment Confirmed	
060-070-085-04	00318 WALLS SIDE RD	PAGNUCCO, CHRISTINE		RT	D(i)	2022-008	(746.24)	-	(746.24)
060-070-132-06	00574 AIRPORT RD	MARKS BAY II LTD		RT	D(i)	2022-009	(698.61)	(2.10)	(700.71)
						REPORT TOTAL	**$ (8,796.33)**	**$ (192.83)**	**$ (8,989.16)**

A. CEASES TO BE LIABLE FOR TAX AT RATE IT WAS TAXED
B. BECAME VACANT OR EXCESS LAND
C. BECAME EXEMPT
D. SICKNESS OR EXTREME POVERTY

D(i). RAZED BY FIRE, DEMOLITION OR OTHERWISE
D(ii). DAMAGED AND SUBSTANTIALLY UNUSABLE
E. MOBILE UNIT REMOVED
F. GROSS OR MANIFEST CLERICAL/FACTUAL ERROR
G. REPAIRS/RENO'S PREVENTING NORMAL USE (MIN 3 MONTHS)

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	**Mayor Christian Provenzano and Members of City Council**
AUTHOR:	**Karen Marlow, Manager of Purchasing**
DEPARTMENT:	**Finance Department**
RE:	**Tender for Mausoleum Expansion – Phase XVI**

PURPOSE

Attached hereto for your information and consideration is a summary of the tenders received for City Cemetery Mausoleum Expansion – Phase XVI, as required by the Cemeteries Division – Community Development & Enterprise Services. Staff is seeking Council approval of the tender recommendation.

BACKGROUND

The tender was publicly advertised and bidders notified through Construction Association Plan Room. A virtual public opening of the tenders took place on May 5, 2022 with the Deputy City Clerk in attendance, results posted on the City website.

ANALYSIS

Following opening, it was determined to issue a Post-Tender Addendum for the two bidders, submitting Separate and Alternate Price Option bids. The consolidated tenders received have been thoroughly evaluated and reviewed with the City's Consultant for the project, IDEA Inc. (Julia DeFelice); the Manager of Cemeteries; and the Director of Community Services. Ms. DeFelice's report concerning the tenders received is attached for your reference.

FINANCIAL IMPLICATIONS

The low tendered price submitted by EllisDon Industrial Inc., including Alternate Price Option 1 and meeting specifications as recommended by the City's Consultant is $1,760,000 (plus HST).

During 2022 Budget deliberations Council approved the allocation of $1,100,000 for Cemetery Mausoleum Crypts. After costs of Architectural and Engineering Professional fees, the value remaining for Construction is $1,050,500.

A corresponding price increase for Mausoleum Crypt Sales has been determined, that will cover the total construction and engineering costs, including non-

rebateable HST, of $1,841,350. Anticipated demand remains strong, backed by inquiries received to date as to when sales will commence for the 16th build. This follows excellent sales for the most recent build (15th) which essentially sold out in a two-day timeframe.

The Cemetery Reserve Fund uncommitted balance does not cover the full cost of the project. Internal debt will be utilized for the difference of $1,121,000 to be serviced from the sale of the crypts.

STRATEGIC PLAN / POLICY IMPACT

Provision of New Infrastructure is included in the Infrastructure focus area of the Corporate Strategic Plan.

RECOMMENDATION

Resolved that the report of the Manager of Purchasing dated June 13, 2022 be received and that the Tender submitted by EllisDon Industrial Inc. for Construction of the Mausoleum Expansion – Phase XVI at the tendered price of $1,760,000 plus HST, as requested by Cemeteries Division - Community Development and Enterprise Services, be approved.

Further that the CAO be authorized to countersign the Tender Recommendation of City's Consultant (IDEA Inc.); and further that the City's Consultant (IDEA Inc.) be authorized to issue a Letter of Intent to EllisDon Industrial Inc. to commence mobilization for the Project.

A By-law authorizing signature of the Contract for this project will appear on a future Council Agenda.

Respectfully submitted,

Karen Marlow
Manager of Purchasing
705.759.5298
k.marlow@cityssm.on.ca

May 25th 2022 IDEA Project No. 22009

Corporation of the City of Sault Ste. Marie
c/o Greenwood Cemetery
27 Fourth Line East
Sault Ste. Marie, Ontario
P6A 5K8

Attention: Mayor and City Council

Re: Municipal Mausoleum, Phase XVI
Tender Recommendation

Dear Sir:
Tenders for the above-noted project was received at the City Clerk's Office at the City of Sault Ste. Marie before the required time on May 5th, 2022. These submissions were opened in a public meeting held the same day at 2:00 p.m. at the Civic Centre. Two (2) Stipulated Sum Tendered Amounts were received as follows:

EllisDon Industrial Inc.	$1,900,000.00 plus HST
Ruscio Masonry and Construction Ltd.	$2,115,000.00 plus HST

Following the Public Tender Opening it was determined that the next steps would be to prepare and issue a Post-Tender Addendum for the two contractors to submit follow up bids. The Post Tender Addendum was issued on May 9th and included Alternate Price Option 1 for the Structural Pre-Cast Concrete Crypt System with manufacturer contact information provided, and Separate Price Options 1a – 1d for removal of crypt rows.

Post-Tender bids were received at the City Clerk's Office at the City of Sault Ste. Marie before the required time on May 20th, 2022. These submissions were opened in a public meeting held the same day at 2:00 p.m. at the Civic Centre. Bids were received from both Contractors as follows:

EllisDon Industrial Inc.

SPO 1a	-$20,000.00
SPO 1b	-$40,000.00
SPO 1c	-$60,000.00
SPO 1d	-$80,000.00
APO 1	-$140,000.00
	20 weeks

Ruscio Masonry Construction Ltd.

SPO 1a	-$15,000.00
SPO 1b	-$30,000.00
SPO 1c	-$45,000.00
SPO 1d	-$60,000.00
APO 1	-$118,000.00
	-6 weeks

As your Consultants, we have reviewed the tender and post-tender submissions (tender forms and supplementary information), in accordance with the requirements of the Tender Documents, Industry Standards. We have also considered all Separate and Alternate Price Options and determined that acceptance of any combination of SPO / APOs will not impact the determination of the low bidder.

The low tender was received from **EllisDon.** in the amount of **$1,900,000.** It is complete, without errors and as such meets the requirements of the tender call. Ellis Don have indicated in their Tender that they agree to complete the Work of the Base Bid Contract within **52 weeks** from date of tender award.

Separate Price Option 1(a,b,c,d) – Remove (1,2,3,4) rows of Crypts

The pricing submitted for Separate Price Option Number 1 (SPO1) was to remove rows of crypts from the scope of the project. Pricing received for SPO1 varied by 33% between the tender submissions received, with EllisDon offering the higher credit. Given the low value of this credit, relative to the overall project cost / Crypt, we are of the opinion that the cost submitted does not represent "good value". We recommend that none of the SPOs be accepted.

Alternate Price Option 1 – Structural Precast Modular Concrete Crypt System

The pricing submitted for Alternate Price Option Number 1 (APO1) was to revise the scope of the project to include Precast Crypts, to explore the market for associated cost and schedule savings. Pricing received for APO1 varied by 19% between the tender submissions received, with EllisDon offering the lowest credit. Given the value of this credit and associated impact to schedule, we are of the opinion that the cost submitted presents "good value". We recommend that it be accepted. If you choose to accept the credit associated with APO1, the following is a summary of the proposed contract price for this project:

Tender Amount	$1,900,000.00
Alternate Price Option 1	-$140,000.00
Total Tender Amount	$1,760,000.00 plus HST

We recommend that the low Tender submitted by **EllisDon Industrial Inc.** be accepted, including APO1 for a Stipulated Contract Price of **$1,760,000.00 plus HST**

If you agree with this recommendation, please countersign this document in the space provided and return it to our office. Upon receipt of the countersigned letter, we will issue the **"Letter of Intent"** to the Contractor on your behalf. The Letter of Intent indicates your intent to enter into a Contract for the project and will allow the contractor to begin securing contracts with their sub-trades and suppliers. With the receipt of the countersigned letter we will also begin the preparation of the formal contracts on your behalf.

Should you have any additional questions or require any additional information, please do not hesitate to contact this office.

Yours very truly,

IDEA Inc.
Integrated Design – Engineering + Architecture
Julia DeFelice M.Arch, MRAIC
Intern Architect

Acceptance of Separate Price No. 1a at this time (please circle)	YES	NO
Acceptance of Separate Price No. 1b at this time (please circle)	YES	NO
Acceptance of Separate Price No. 1c at this time (please circle)	YES	NO
Acceptance of Separate Price No. 1d at this time (please circle)	YES	NO

Acceptance of Alternate Price No. 1 at this time (please circle) YES NO

Owner's Authorized Representative

_____

Signature Print Name

_____

Date

cc: (via email)

Karen Marlow	Manager, Purchasing
Roger Nenonen	Manager, Cemeteries
Brent Lamming	Director, Community Services
Curtis Berkenbosch	IDEA Inc.

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Karen Marlow, Manager of Purchasing
DEPARTMENT:	Corporate Services
RE:	RFP – Supply and Delivery of Soft Drink Concession Supplies

---

Purpose

This report has been prepared for your information and consideration, on behalf of the Evaluation Committee, concerning proposals received for the supply and delivery of Soft Drink Concession Supplies at the concessions operated by the Community Service Department as well as through vending machines at various CSD locations for a period of three (3) years with option to renew for up to two 1-year periods. Staff is seeking Council approval of the Evaluation Committee's recommendation.

Background

The Request for Proposal was publicly advertised, and proposal document forwarded to all firms on our bidders list. Proposals were required to be submitted for consideration no later than 4:00 p.m. on May 18, 2022.

Analysis

Proposals from one (1) proponent was received prior to closing deadline:

PepsiCo Beverages Canada, Sault, ON

The proposal received has been evaluated by a committee comprised of city staff from the Community Development & Enterprise Services. It is the consensus of the Evaluation Committee that although only one proposal was received, the proponent PepsiCo Beverages meets the specified criteria and scored adequately in the evaluation process. PepsiCo is the present provider of these services.

Environmental considerations including recycled content packaging are within the proponent's strategy.

Financial Implications

PepsiCo Beverages Canada has proposed the following guaranteed payments in exchange for exclusivity in the supply of Soft Drink Concession Supplies for the concessions and for the management of soft drink beverage machines at various CSD locations:

Signing Bonus (one time)	$ 5,000

Annual Payments	$21,000
Annual Marketing Fund Contribution	$ 3,000

The contract period will start August 1, 2022 continuing for three (3) years until July 31, 2025, allowing for extension for up to two (2) additional years by mutual agreement. The listed guaranteed payments apply for all five (5) years; and secured pricing schedules for soft drink products and supplies have been provided.

Strategic Plan / Policy Impact
This is an operational matter not articulated in the Corporate Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Manager of Purchasing dated June 13, 2022 be received and that the Proposal submitted by PepsiCo Beverages for the Supply and Delivery of Soft Drink Concession Supplies for the City of Sault Ste. Marie, for a period of three (3) years with option to renew for up to two 1-year periods, be approved.

A By-law authorizing signature of the Agreement for this project will appear on a future Council Agenda

Respectfully submitted,

Karen Marlow
Manager of Purchasing
705-759-5298
k.marlow@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Travis Anderson, Director Tourism & Community Development
DEPARTMENT:	Community Development and Enterprise Services
RE:	Tourism Development Fund Applications

Purpose

This report provides recommendations to City Council from City staff and the Tourism Sault Ste. Marie Board of Directors for the distribution of Tourism Development Funds.

Background

The Tourism Development Fund (TDF) was implemented June 1, 2021 to provide financial support to the broader tourism sector in two different streams- Festivals & Special Events and Attractions & Product Development. The funds for both streams of the TDF are generated from revenue collected by the Municipal Accommodation Tax (MAT).

Consideration will be given to support initiatives that produce positive results in at least one of the following criteria:

- Development quality tourism products & events;
- Increase in overnight stays and visitor spending in Sault Ste. Marie;
- Enhancement of the Sault's tourism product offerings;
- Support of the city's reputation and position as a first-rate visitor destination;
- Fulfill a gap in the tourism visitor experience landscape; and
- Encourage private sector tourism investment in SSM

Upon receipt of a TDF application, Tourism staff reviews the application for eligibility and assessment criteria and brings a recommendation forward to the Tourism Sault Ste. Marie Board of Directors. The Tourism Sault Ste. Marie Board of Directors further evaluates the applications and makes a recommendation to City Council for the distribution of the grant funds.

Analysis

Tourism Development Fund applications are permitted with ongoing intake and are reviewed monthly at the Tourism Sault Ste. Marie Board of Directors meetings. At the Tourism Sault Ste. Marie Board of Directors meeting May 19, 2022 five (5) applications were reviewed with the following recommendations:

1. Poutine Feast ($5000)
2. Queen Street Cruise ($5000)
3. Marconi Meets World ($10,000)
4. Canadian Institute of Forestry 2022 Conference and AGM ($5,000)
5. Forest the Canoe- Adventure Bus ($15,000)

Poutine Feast

Poutine Feast is a complementary festival to Canada Day programming in the downtown area. Operating from June 30 – July 3, 2022, Poutine Feast is a culinary festival of poutine food vendors, entertainment, family activities and vendor market. In 2019 Poutine Feast realized over 10,000 visitors to the site. The Tourism SSM Board recognizes that Poutine Feast is not a destination driver, rather an experience that fills a gap for visitors over the Canada Day weekend. Poutine Feast provides a complementary experience to help keep visitors in the downtown area and helps to create a vibrant community space. Poutine Feast plays an important role in extending visitor stay and is anticipated to contribute approximately $60,000 of additional visitor spending in the community.

Queen Street Cruise

June 17-18, 2022

Queen Street Cruise is an annual car show/festival that is held in the downtown (Queen Street/ GFL parking lot). The event generates support for local charities through the donation of registration funds. The goal of this event is to grow from a community initiative to a tourism driver in coming years. The Queen Street Cruise is looking to replicate the success of the St. Ignace Car show and create an event in Sault Ste. Marie that attracts large numbers of out of town registrations and spectators. To do so Tourism Development Funds are requested to support marketing efforts (Television and Radio).

Marconi Meets World

July 21-23, 2022

The Marconi Meets World Festival is an expansion of the one day Italian Festival previously hosted by the Marconi. The festival is scheduled for July 21-23, 2022. In an effort to rebrand to a multicultural centre the Marconi Meets World event celebrates cultural diversity over three days with open markets, cultural food and entertainment. One day is dedicated to Indigenous Culture and another to Italian culture. Tourism Development Funds are requested to support entertainment and marketing for the festival. Event organizers are planning to attract 1600+ people from out of town for this event including participating performers, vendors and spectators. Marconi Meets World has been identified as an event with growth potential and will play an important role in extending visitor stay and is anticipated

to contribute approximately $122,000 of additional visitor spending in the community

Canadian Institute of Forestry 2022 Conference and AGM
September 11-14, 2022
Each year the Canadian Institute of Forestry/Institute forestier du Canada (CIF-IFC) hosts a National Conference and Annual General Meeting (AGM). This year, the Conference is hosted in collaboration with the CIF-IFC Central Ontario Section, and is taking place in Sault Ste. Marie, Ontario. The conference was secured through a bid submission and was initially scheduled for 2020 (postponed during pandemic). Over 4 days, the Conference will bring together a diverse set of voices with a variety of delegates, sponsors/exhibitors, speakers and moderators from across the forest sector (government, academia, non-profit, industry, student/new professionals, etc.). 250 delegates, both national and international, will attend the conference.

Forest the Canoe- True North Adventure Bus
Forest the Canoe is a nature-based adventure company with its base camp on the shore of Lake Superior in Goulais River. They offer a range of guided canoe and hiking tours, camping trips, overnight accommodations, and canoe/kayak rental services to Sault Ste. Marie and broader community. Forest the Canoe is proposing a guided bus tour and shuttle service for outdoor adventure and nature-based tourists in Sault Ste. Marie. True North Adventure Bus will operate for a pilot period of August 22, 2022 to October 8, 2022. The Bus will partner with local hotels and other tourism operators to provide 1 and 2-day guided bus tours with fixed itineraries to allow tourists to explore all the outdoor adventures in and around Sault Ste. Marie. Forest the Canoe also plan to utilize the adventure bus to provide shuttles along with canoe and kayak rentals. Forest the Canoe have requested funds to rent a 12 passenger van for the duration of the pilot project and for funding to assist with the purchase of marketing materials to offer 1 and 2-day guided bus tours, shuttles, and canoe/kayak rentals.

The Tourism Sault Ste. Marie Board of Directors favourably supports the above TDF requests and the following resolutions were passed

“Be it resolved that Tourism Sault Ste. Marie recommend a contribution up to $5,000 through the Tourism Development Fund- Conferences and Special Events stream to support the 2022 CIF-IFC Conference and 114th Annual General Meeting and that a report be submitted to City Council for consideration and approval.”
Mover: Kelly W.
Seconder: Lawrence F.

“Be it resolved that Tourism Sault Ste. Marie recommend a contribution up to $10,000 through the Tourism Development Fund- Conferences and Special

Events stream to support the Marconi Meets World event July 21-23, 2022 and that a report be submitted to City Council for consideration and approval."
Mover: Nicholas B.
Seconder: Elia M.

"Be it resolved that Tourism Sault Ste. Marie recommend a contribution up to $5,000 through the Tourism Development Fund- Conferences and Special Events stream to support the Poutine Feast June 30- July 3, 2022 and that a report be submitted to City Council for consideration and approval."
Mover
Seconder

"Be it resolved that Tourism Sault Ste. Marie recommend a contribution up to $5,000 through the Tourism Development Fund- Conferences and Special Events stream to support the Queen St. Cruise June 17-18, 2022 and that a report be submitted to City Council for consideration and approval."
Mover: Kelly W.
Seconder: Lawrence F.

"Be it resolved that Tourism Sault Ste. Marie recommend a $15,000 contribution through the Tourism Development Fund- Product Development Stream to support Forest The Canoe's application for a True North Adventure Bus operating August 22 – October 8, 2022 and that a report be submitted to City Council for consideration and approval."
Mover: Kelly W.
Seconder: Brad R.

Financial Implications
No new funds would be required. The Tourism Development Fund currently has $227,110 uncommitted for the purposes of financial assistance within the tourism sector.

Strategic Plan / Policy Impact
This item supports the following Corporate Strategic Plans Focus areas:

- Community Development and Partnership focus of Maximizing Economic Development & Investment with the commitment to maintain financial viability.
- Community Development- Develop partnerships with key stakeholders and reconciliation.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Tourism and Community Development dated June 13, 2022 concerning the May 2022 Tourism Development Fund Applications be received and that the recommendation of the Tourism Sault Ste. Marie Board of Directors to support the following five projects for the amounts listed below, be approved.

1. Poutine Feast ($5000)
2. Queen Street Cruise ($5000)
3. Marconi Meets World ($10,000)
4. Canadian Institute of Forestry 2022 Conference and AGM ($5,000)
5. Forest the Canoe- Adventure Bus ($15,000)

Respectfully submitted,

Travis Anderson
Director Tourism & Community Development
705.989.7915
t.anderson@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Brent Lamming, Director of Community Services
DEPARTMENT:	Community Development and Enterprise Services
RE:	Green Burials

PURPOSE

The purpose of this report is provide Council information on what Green Burials are and the actions the Cemetery Division is taking to plan for the future.

BACKGROUND

There has been more interest in the concept of “Green Burials” to provide an alternative for more natural means of burial.

Cemeteries now includes in its mandate a goal to protect land and resources in alignment with increased environmental awareness and protection. With this consideration, it may be timely for Council to consider whether the Cemetery should designate a portion of its burial grounds in order to serve these particular interests.

Please refer to the attached paper prepared by Roger Nenonen, Manager Cemeteries for background information (Appendix A - Green Burials Background).

ANALYSIS

Cemetery staff have been tracking interest and working together with different groups to explore Green Burial options for the Cemetery in Sault Ste. Marie. Further to local requests, the recommended approach moving forward would be as follows:

1. Reserve a small section of Cemetery land; the characteristics of burials in that section would include the following, or a portion thereof:

a) Container: instead of a conventional casket, a cloth shroud, or simple wooden box, unfinished (no coatings, lacquers, etc.), is used;
b) Embalming: no embalming fluid used;

c) Monuments: individual monuments on graves would not be permitted; instead, a community monument at the “section” of graves is suggested;
d) Burial grounds are returned to their natural state following interment: wild grass, flowers, trees, would grow among the graves;
e) Further to point (d), the allocation of graves, in a designated “green” section, would have burials done in sequence, one next to the other, in order to fill a given green section;
f) Burials would be limited to one per grave, at single depth;
g) Disinterment would not be permitted, unless ordered by police or the coroner.

This report is for information only and should Council request, Cemetery staff would be happy to report on detailed plans to create a green section within existing cemetery lands. Any future recommendations would be vetted through the Bereavement Authority of Ontario (BAO). The BAO is a government delegated authority administering provisions of the Funeral, Burial and Cremation Services Act, 2002 (FBCSA) on behalf of the Ministry of Government and Consumer Services.

FINANCIAL IMPLICATIONS
The recommended option will not impact the 2022 Operating Budget.

STRATEGIC PLAN / POLICY IMPACT
The recommendation supports the focus area of the Community Strategic Plan for 2021-2024 in a number of ways.

- Aligns with Environmental Stewardship using resources wisely to maintain and create a sustainable city for future generations.
- Within the Service Delivery focus area, it continues to assist in delivering excellent customer service to citizens.
- Additionally it supports the focus to the Commitment to Citizens and Community by providing inclusive and accessible services to our diverse community.

RECOMMENDATION
It is therefore recommended that Council take the following action:

Resolved that the report of the Director, Community Services concerning Green Burials dated June 13, 2022 be received as information.

Respectfully submitted,

Brent Lamming, PFP, CPA, CMA
Director, Community Services
Community Development & Enterprise Services
(705)759-5314

Green Burials for Sault Ste. Marie?

What are Green Burials?

Green burials refer to interments of human remains, in a much more basic, natural manner. What that means is that remains are not embalmed, and are buried without a traditional, ornate, casket. The "green" term implies that the absence of embalming chemicals, along with the finishing products used on a casket, are prevented from entering the environment, post burial.

The characteristics of green burial provide ecological, and other, benefits, compared to conventional burial. These are:

1) Improved Land Use: burial sites are not arrayed in lots and ranges, and thereby use a smaller footprint. Efficiencies are improved, since ongoing maintenance is virtually eliminated, as the land returns to its natural state.
2) Habitat Enhancement: burial sites return to nature, through the planting of trees, shrubs, etc., providing a home for wildlife. Diversity is improved for plants and animals.
3) Water Drainage: burial sites are shallow, and lack granite and concrete structures; the water table and soil permeability is maintained. The result is that ground water can drain and absorb normally.
4) Chemicals are Eliminated: preservation chemicals are prevented from entering the soil, thereby allowing the soil and water to remain unaltered. A cloth shroud, or simple, untreated wooden container is used to inter remains. This also ensures that no further chemicals (e.g., varnishes, paints, dyes, etc.) enter the ground. Lastly, the use of pesticides are eliminated as well.
5) Land Conservation and Restoration: burial sites are allowed to return to their natural state, in perpetuity. This benefits the environment for all, and allows the land to makes its best contribution, in its function for nature, and provision of visual beauty.
6) Resource Reduction: since caskets are not a primary option for burial, fewer trees are used for making caskets. The use of other materials, like steel and concrete, are also not needed. According to the National Geographic, "American funerals are responsible each year for the felling of 30 million board feet of casket wood (some of which comes from tropical hardwoods) , 90,000 tons of steel, 1.6 million tons of concrete for burial vaults, and 800,000 gallons of embalming fluid." The use of a shroud is encouraged (as in Jewish custom), as it not only reduces resource consumption, but aids in decomposition of the remains.
7) Alternative to Cremation: while cremation is widely practiced (close to 70 percent of North Americans), it is known to emit some harmful products. These include dioxin, hydrochloric acid, sulfur dioxide, and carbon monoxide. Control of these emissions is therefore recommended and monitored by the cremator operator. Cremation also uses natural gas (27 litres per body on average) as the most common furnace fuel; opting out saves some of this fuel for other uses.

Full Body Burial and Cremation

The choice of disposition of human remains is influenced by religious practices and the limitations of land space. “For example, cremation was not uncommon in the Bronze Age, but its popularity declined with the rise of Christianity. Whereas the Christians wore white at funerals and celebrated the passing of the dead as a relatively joyous event, the arrival of the Normans in 1066 brought with it a fear of the dead, and the mood became somber, with an emphasis of God’s Judgement Day, sin, and punishment.”

Burial was very common up to the 16th century, and was a temporary thing: remains were buried for several years, then disinterred and placed in a Charnel House (a vault or building where human skeletal remains are stored on masse). Therefore land use and resources were minimized; coffins were simply temporary means to transport human remains. Following that period, in the 17th century, permanent burial sites became more common, and with population growth, resulted in a shortage of land space. The 19th century brought on development/organization of cemeteries as we know them today, along with the reemergence of cremation.

In modern times, cremation is the most common choice around the world, as land space and lower cost are the main factors. Conventional burial involves a much higher cost, with greater land use, more resources, and higher service costs. The death care industry has evolved into a billion dollar industry; supported by a public that links a dignified burial to one that costs a great deal of money. “The average adult’s funeral, including undertaker’s bill, cemetery fees, a burial vault, flowers, clothing, transportation, and other related charges costs about $10,000 U.S.F.”

Today’s cemeteries are arranged and surveyed to accommodate conventional full body and cremation interments. The land needed for a full adult grave (casket) is about 48 inches x 120 inches: the length is needed for a monument installation (36 inches x 24 inches). Beyond that, mausoleums, both indoor and outdoor, are used for above ground (full body) interments, at a high initial, and ongoing, cost. Cremation interments are either in ground, or above (columbaria). At any rate, the maintenance and care of the above ground structures, or the grounds, with their monuments and manicured grass, require ongoing, perpetual care.

Green Cemeteries in Operation Today

Currently, Canada has four green cemeteries in operation: Royal Oak Burial Park, Victoria, British Columbia; Union Cemetery, Cobourg, Ontario; Mount Pleasant Group (Meadowvale, Brampton (West), and Duffin Meadows (Brampton (East). Having received feedback (from a survey of questions, along with phone conversations) from each of these cemeteries, some general themes emerge.

The green burial concept was offered simply to provide the public with a broader selection of options, with little regard for increasing revenue. For example, Mount Pleasant Group of cemeteries, who operate two of the Ontario green cemeteries, have interred about twenty individuals. Cobourg Cemetery noted a similar statistic, adding that the green burial route

would not be operationally (and economically) viable on its own. In every case, the cemeteries have traditional burial options, making up the bulk of their services.

The question was raised about potential disinterment, which may be an issue particularly when remains are under a tree, etc. None of the cemeteries contacted had encountered this issue; however it would be a good point to raise with families prior to interment.

Community acceptance has been positive where green burials are practiced, as the rationale has been communicated adequately in contract, and on cemetery web sites. Generally speaking, simple themes of contributing to preservation of nature, a dignified burial without costly embellishment, and a sense of community and ecological respect are upheld. It is said that individuals seeking this route appreciate and understand that a dignified burial requires few of the ceremonial extras, commonly marketed by the death care industry today.

Sault Ste. Marie Cemeteries & Corporate Strategic Plan

The City of Sault Ste. Marie operates four active cemeteries; here is a brief history:

West Korah Cemetery
It is a 5 acre site, donated by Mr. Coverdale and Mr. Vivian in the years 1870 and 1887, respectively. This cemetery became City property in 1965, following the amalgamation of Tarentorous and Korah Townships.

Pine Grove Cemetery
The 5 acre site was a donation from Mr. Lamon in 1888. Burials are available only to lot owners of previous record. This cemetery became City property in 1965, following the amalgamation of Tarentorous and Korah Townships.

Greenwood Cemetery
This cemetery was started by a private company, having its first interment in 1901. Ownership of the cemetery by the City began in 1922. The cemetery includes “New Greenwood”, “Old Greenwood”, and the “West Section”.

Holy Sepulchre Cemetery
This cemetery dates back to the mid 1800’s, with the first Catholic cemetery being a parish burial yard on Queen Street. Following that, a second and third cemetery came into operation, on Great Northern Road, and the present site of St. Ignatius Cemetery (in the north section of Holy Sepulchre Cemetery today), respectively. Remains were transferred from Great Northern Road to the present Holy Sepulchre Cemetery. The Catholic Church purchased property off the 4th Line in 1940, with Bishop Dignon (North Bay), amalgamating all the cemeteries under the

same name, “Holy Sepulchre”, also in 1940. Finally, on July 26, 1971, the responsibility from the cane ad administration for Holy Sepulchre, as a Catholic cemetery, became that of the Community Services Board of Sault Ste. Marie.

The City cemeteries allow traditional burial practices, including full body and cremation. Grave types would include in-ground and above-ground (mausoleum and columbarium). Remains are typically placed in a casket, urn, or custom made container; full bodies are usually embalmed. The City also has sections reserved for Jewish individuals, Jehovah’s Witness followers, the Muslim Community, and Catholic priests. Further to that, it is recognized that unique customs are in place, regarding Chinese, United Church, Greek, Muslim, and Jewish patrons.

The Corporate Strategic Plan for Sault Ste. Marie indicates some alignment, at least in concept, with green burials. For example, the value of “environmental stewardship” with the aim of “maintaining and creating a sustainable city for future generations” is advocated. The aspect of quality of life is also relevant, as green burials could “create new public spaces” to help “support competiveness on a global scale”. The director of cemeteries for Mount Pleasant Group of Cemeteries noted that the option, in their case, created good public relations, demonstrating progressive thinking.

Green Burials for Sault Ste. Marie?

Sault Ste. Marie cemeteries serve a moderate sized, and aging, population at present. Close to 70 percent of interments are cremations, with the trend of grave selection moving to above ground structures. A common issue with ground burials, from cemetery patrons in particular, is the ongoing maintenance required. With all of the present options, the premise is always to support memorialization, by way of a monument, plaque, etc., with engraving.

The cemeteries have plenty of land that could be developed for a green burial section(s), e.g., Pine Grove, northwest side, and in the Holy Sepulchre, northeast section). Space is certainly not an issue, and with Pine Grove Cemetery in particular, available land is filled with trees and undeveloped; creation of a “green” section would be less involved than conversion of a manicured area.

From the perspective of the Bereavement Authority of Ontario, establishing a green cemetery really begins with community acceptance, along with municipal approvals. Cost of graves, for the cemeteries surveyed, remain the same as conventional graves. The BAO administers the care and maintenance trust fund in the same way; the exception being the absence of monument fees processing (since monuments are not placed).
Would green burials be a worthwhile option in the Sault Ste. Marie cemeteries? The pros, in summary, would be:

1) Diversity—provides a truly different, and unique, option to the consumer
2) Ecology—provides an interment route that has the smallest impact on the environment, overall
3) Quality of Life—linked to point's one and two, green burial provides an option that may enhance quality of life in the long run, as future generations will benefit
4) Cost—the life cycle cost of a typical grave, in terms of maintenance, is high and continues into perpetuity
5) Public Relations—provides an image of the municipality that shows concern for the above noted points

In conclusion, it is the author's view that green burial, as an option, may be worthy of further investigation and consideration. The other cemeteries surveyed noted that establishing an operating green burial cemetery was a lengthy process (several years), however a worthwhile one. With the present connectedness of societies (education), along with a general zeitgeist to save the environment and money, the green burial concept may well see rising demand.

Roger Nenonen
May 20, 2022

References

"A Short History of Burials", Brocklands Woodland Burial, North Yorkshire, England, 2012

"Eco-Afterlife: Green Burial Options", Scientific American, May, 2017

"Green Burial at Royal Oak Burial Park", Web Page, Royal Oak Burial Park, Victoria, British Columbia, 2017

"History of Cobourg Union Cemetery", Web Page, Cobourg Union Cemetery, 2017

"How It Works", Natural Burial Association, 2013

May, Gary, "The Green Final Frontier: Eco-Burial", The Globe and Mail, March, 2010

Maxwell, Joel, "Final Rest the Natural Way", The Kapit Observer, May, 2012

Miller, Ruth, "Landscapes of the Dead: An Argument for Conservation Burial", September, 2012

"One of America's First Green Cemeteries", Circle Cemetery, 2017

"The 5 Principles of Green Burial", Green Burial Association of Canada, 2011

"Toxic Emissions from Crematories: A Review", Environment International, 36, (2010), 131-137

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Virginia McLeod, Manager of Recreation and Culture
DEPARTMENT:	Community Development and Enterprise Services
RE:	Arts and Culture Assistance Grants Late Intake 2022

Purpose

This report provides recommendations to City Council from the Cultural Vitality Committee for the distribution of the 2022 Arts and Culture Assistance Grants for the late intake period.

Background

The Cultural Vitality Committee on behalf of City Council evaluates the applications against the criteria in the City's Arts and Culture Assistance Program criteria and makes a recommendation to City Council for the distribution of the grant funds.

The new Arts and Culture Assistance Program (ACAP) Criteria was approved in 2021. The application period for the second intake closed on March 25, 2022. The new guidelines provide funding support, in line with the priorities identified in the Community Culture Plan 2019-2024 to foster growth and development of the local arts and culture sector.

Analysis

There were six (6) applications submitted in the second intake period for funding in 2022 with requests totalling $46,800. A minimum score of 50% is required to be considered for the grant. One application did not meet this threshold. The total funding available annually for Arts and Culture Assistance Program is $104,500.

CVC members scored each of the applications using one of the two evaluation rubrics which each have three assessment criteria:
Incorporated Non-profits:

1. Organizational and Financial Health
2. Artistic and/or Cultural Merit
3. Community Impact:

Unincorporated Collective/individual

1. Artistic and/or Cultural Merit
2. Community Impact

3. Viability or Project/Activity

Members of the Cultural Vitality Committee met on two occasions to score and review the applications for the late intake. Meetings were held on May 25 and June 1, 2022. Initially, funding was allocated based on the overall score, further reductions were required as the amounts exceeded the total funds available.

At the June 1, 2022 meeting the Cultural Vitality Committee passed the following resolution:

Moved by: A. Pinhiero
Seconded by: K. Blunt

Resolved that the Cultural Vitality Committee recommend to City Council that a total of $27,212 be awarded for the late intake of the Art and Culture Assistance Program Grant in the following amounts:

Organization Name:	Project Name	Requested Funding:	Recommended Funding
Algoma Arts Festival Association	50th Anniversary Algoma Fall Festival	$20,000	$11,512
Northern Ontario Latin Hispanic Association	Gala Latina 2022	$5,000	$3,123
Sault Film Festival	Sault Film Festival	$10,000	$6,732
Over the Rainbow	Children's Entertainment Series	$4,000	$2,586
Sault Theatre Workshop	Sault Theatre Workshop – Operating grant	$5,000	$3,259
TOTAL		$44,000	$27,212

CARRIED

Financial Implications
An amount of $104,500 is included in the City's operating budget for the purpose of financial assistance as per the City's Cultural Policy on providing arms-length funding of culture. The allocation of $27,212 can be accommodated within the approved budget.

Strategic Plan / Policy Impact
Corporate Strategic Plans Focus Area: Quality of Life - Promote, grow and support cultural activities identified the cultural plan implementation as a key activity.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Manager of Recreation and Culture dated June 13, 2022 concerning the Arts and Culture Assistance Grants Late Intake 2022 be received that the following grants be approved:

1. Algoma Arts Festival Association - $11,512.00
2. Northern Ontario Latin Hispanic Association- $3,123.00
3. Sault Film Festival - $6,732.00
4. Over the Rainbow $2,586.00
5. Sault Theatre Workshop $3,259.00

Respectfully submitted

Virginia McLeod
Manager of Recreation and Culture
705.759-5311
v.mcleod@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Emily Cormier, Sustainability Coordinator
DEPARTMENT:	Community Development and Enterprise Services
RE:	May 2022 Community Development Fund Green Initiatives Program Applications

---

Purpose

The purpose of this report is to seek Councils approval to allocate $12,335.78 towards three projects recommended by the Environmental Sustainability Committee for the distribution of Community Development Fund (CDF) – Green Initiatives Program funds.

Background

The Green Initiatives Program of the Community Development Fund (CDF) purpose is to support green initiatives that result in reduced greenhouse gas emissions (GHGs), improve water quality / rehabilitation or increase energy efficiency. The City of Sault Ste. Marie's (the City) Environmental Sustainability Committee (ESC) is responsible for making recommendations for the allocation of funds for eligible projects or programs that support the City's environment plans and practices. Funding applications are reviewed by the ESC in accordance with the CDF – Green Initiatives Program guidelines and are accepted on an rolling intake throughout the year. Total annual funds available for all projects under the CDF – Green Initiatives Program in 2021 is $50,000. Eligible applicants include non-profit organizations and City departments.

Three projects were presented to the ESC on May 12, 2022. The committee passed the following resolutions:

Moved by: A. Riopel
Seconded by: R. Abakar
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $3,355.00 for the City of Sault Ste. Marie's Stormwater Art project and recommends that Council approve the request.

Moved by: E. Emilson

Seconded by: R. Abakar
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $4,051.05 for the Sault Ste. Marie YMCA Aeroponic Garden project and recommends that Council approve the request.

Moved by: P. Antunes
Seconded by: E. Emilson
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $4,929.73 for Blue Mar 4 Change's Shoreline Cleanup project and recommends that Council approve the request.

Analysis

City of Sault Ste. Marie Stormwater Art Project

The stormwater art project purpose is to draw attention to the community storm drainage system and to educate the public on the connection between stormwater runoff and the St. Mary's River. Twelve (12) stormwater intakes will be painted during the summer as a pilot project to bring awareness to potential water pollutants such as litter, debris, and hazardous chemicals entering the storm drainage system. Youth artists will be selected to paint locations near Superior Heights, Korah, White Pines, St. Mary's College, Sault College and Algoma University, and an additional six locations will be painted focusing on in the downtown/waterfront area utilizing a variety of local artists. A key project partner includes the Sault Ste. Marie Public Library who plan to host a 'Libraries Loves Lakes' outreach showcase during the painting project this summer, which will include a display of books about lakes, water conservation and freshwater protection. This project supports the Green Initiatives Program fund pillar of improving water quality / rehabilitation.

Sault Ste. Marie YMCA Aeroponic Garden Project

The tower garden project purpose is to incorporate three (3) vertical aeroponics tower gardens into the YMCAs Summer Youth Farm Camp programming. The gardens will not only provide YMCA youth with a food source, but they will also be used for educational programming to learn about the environment, sustainable farming and healthy eating. Excess food can be shared with other youth programming throughout the year as well as possibly donated to local food banks and even support other community meal programs. Research into the tower gardens indicates that the emissions produced by aeroponics for produce cultivation, generate less emissions that traditional growing methods that require the recirculation of water and/or nutrients[1]. As well, they use" cost-effective LED lighting technologies [to] optimize growth."[2] Moreover, by using tower gardens, there is no need for any type of pesticides or herbicides and, as they use 98% less

[1]Stein EW. The Transformative Environmental Effects Large-Scale Indoor Farming May Have On Air, Water, and Soil. Air, Soil and Water Research. January 2021. doi:10.1177/1178622121995819
[2] Pennisi, G, Pistillo, A, Orsini, F, et al. Optimal light intensity for sustainable water and energy use in indoor cultivation of lettuce and basil under red and blue LEDs. Sci Hortic. 2020;272:109508. doi:10.1016/j.scienta.2020.109508.

water because 100% of the nutrients and water are recycled - in essence, it self-waters. As well “indoor farming reduces the point-source production of GHG emissions such as methane, nitrogen, and carbon dioxide. Indoor farming also mitigates the negative impacts of water run-off, soil erosion, pesticide use, and nutrient loading[3]. This project supports the Green Initiatives Program fund pillars of emissions reduction, energy efficiency and improving water quality / rehabilitation.

Blue Mar 4 Change Shoreline Cleanup Project
The shoreline cleanup project will support the second annual Great Canadian Shoreline Cleanup (a national conservation program that provides Canadians across the country the opportunity to take action in their communities where water meets land) in Sault Ste. Marie and result in reduced trash along and within Sault Ste. Marie and area waterways. Two complimentary events for this project include a guided canoe tour by the Lake Superior Watershed Conservancy which will raise greater awareness of the history of our area, indigenous knowledge and fun ways to clean up garbage inaccessible by land. As well as a Citizen Science event with demonstrations on water quality testing. In addition, a promotional film will also be created highlighting events that took place during the cleanup and water stewardship in Sault Ste. Marie. By supporting this initiative, the City of Sault Ste. Marie is also eligible to become a Clean Shoreline Community, where they can join municipalities across Canada who are addressing issues of waste and plastic pollution and helping keep litter out of nature. This project supports the Green Initiatives Program fund pillar of improving water quality / rehabilitation.

Financial Implications
The 2022 Community Development Fund – Green Initiatives Fund currently has an uncommitted balance of $80,685 available to support the three projects in this report totaling $12,335.78. By the end of the year, any remaining funds not used must go towards the purchase of trees for the subsequent year, which trees should be planted in City Parks or on City property by Public Works employees as per a resolution from the March 9, 2020 Council Meeting.

Strategic Plan / Policy Impact
The recommendations support the value and focus areas of the Community Strategic Plan for 2021 – 2024 through:

- Environmental Stewardship: We will use resources wisely to maintain and create a sustainable city for future generations

As well, the Environmental Sustainability Committee, a committee of council has as an objective to review and recommend funding applications to the Community

[3] Stein EW. The Transformative Environmental Effects Large-Scale Indoor Farming May Have On Air, Water, and Soil. Air, Soil and Water Research. January 2021. doi:10.1177/1178622121995819

Development Fund for Environmental Sustainability projects and support local initiatives that promote environmental sustainability.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Sustainability Coordinator dated June 13, 2022 concerning May 2022 Community Development Fund Green Initiatives Program Applications be received, and that the recommendation to support the three projects as follows:

1. City of Sault Ste. Marie Stormwater Art Project in the amount of $3,355.00
2. YMCA Aeroponic Tower Garden Project in the amount of $4,051.05
3. Blue Mar 4 Change Shoreline Cleanup Project in the amount of $4,929.73

be approved.

Respectfully submitted,

Emily Cormier
Sustainability Coordinator
705.989.8748
e.cormier2@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	**Mayor Christian Provenzano and Members of City Council**
AUTHOR:	**Emily Cormier, Sustainability Coordinator**
DEPARTMENT:	**Community Development and Enterprise Services**
RE:	**2022 05 24_CDF GRI May Applications v1.docx**

PURPOSE

The purpose of this report is to seek Councils approval to allocate $12,335.78 towards three (3 projects) recommended by the Environmental Sustainability Committee for the distribution of Community Development Fund (CDF) – Green Initiatives Program funds.

BACKGROUND

The Green Initiatives Program of the Community Development Fund (CDF) purpose is to support green initiatives that result in reduced greenhouse gas emissions (GHGs), improve water quality / rehabilitation or increase energy efficiency. The City of Sault Ste. Marie's (the City) Environmental Sustainability Committee (ESC) is responsible for making recommendations for the allocation of funds for eligible projects or programs that support the City's environment plans and practices. Funding applications are reviewed by the ESC in accordance with the CDF – Green Initiatives Program guidelines and are accepted on an rolling intake throughout the year. Total annual funds available for all projects under the CDF – Green Initiatives Program in 2021 is $50,000. Eligible applicants include non-profit organizations and City departments.

Three projects were presented to the ESC on May 12, 2022. The committee passed the following resolutions:

Moved by: A. Riopel
Seconded by: R. Abakar
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $3,355.00 for the City of Sault Ste. Marie's Stormwater Art project and recommends that Council approve the request.

Moved by: E. Emilson
Seconded by: R. Abakar
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $4,051.05 for the Sault Ste. Marie YMCA Aeroponic Garden project and recommends that Council approve the request.

Moved by: P. Antunes
Seconded by: E. Emilson
Resolved that the Environmental Sustainability Committee supports the request for funding from the CDF - Green Initiatives stream in the amount of $4,929.73 for Blue Mar 4 Change's Shoreline Cleanup project and recommends that Council approve the request.

ANALYSIS

City of Sault Ste. Marie Stormwater Art Project

The stormwater art project purpose is to draw attention to the community storm drainage system and to educate the public on the connection between stormwater runoff and the St. Mary's River. Twelve (12) stormwater intakes will be painted during the summer as a pilot project to bring awareness to potential water pollutants such as litter, debris, and hazardous chemicals entering the storm drainage system. Youth artists will be selected to paint locations near Superior Heights, Korah, White Pines, St. Mary's College, Sault College and Algoma University, and an additional six locations will be painted focusing on in the downtown/waterfront area utilizing a variety of local artists. A key project partner includes the Sault Ste. Marie Public Library who plan to host a 'Libraries Loves Lakes' outreach showcase during the painting project this summer, which will include a display of books about lakes, water conservation and freshwater protection. This project supports the Green Initiatives Program fund pillar of improving water quality / rehabilitation.

Sault Ste. Marie YMCA Aeroponic Garden Project

The tower garden project purpose is to incorporate three (3) vertical aeroponics tower gardens into the YMCAs Summer Youth Farm Camp programming. The gardens will not only provide YMCA youth with a food source, but they will also be used for educational programming to learn about the environment, sustainable farming and healthy eating. Excess food can be shared with other youth programming throughout the year as well as possibly donated to local food banks and even support other community meal programs. Research into the tower gardens indicates that the emissions produced by aeroponics for produce cultivation, generate less emissions that traditional growing methods that require the recirculation of water and/or nutrients[1]. As well, they use" cost-effective LED

[1]Stein EW. The Transformative Environmental Effects Large-Scale Indoor Farming May Have On Air, Water, and Soil. Air, Soil and Water Research. January 2021. doi:10.1177/1178622121995819

lighting technologies [to] optimize growth."[2] Moreover, by using tower gardens, there is no need for any type of pesticides or herbicides and, as they use 98% less water because 100% of the nutrients and water are recycled - in essence, it self-waters. As well "indoor farming reduces the point-source production of GHG emissions such as methane, nitrogen, and carbon dioxide. Indoor farming also mitigates the negative impacts of water run-off, soil erosion, pesticide use, and nutrient loading[3]. This project supports the Green Initiatives Program fund pillars of emissions reduction, energy efficiency and improving water quality / rehabilitation.

Blue Mar 4 Change Shoreline Cleanup Project
The shoreline cleanup project will support the second annual Great Canadian Shoreline Cleanup (a national conservation program that provides Canadians across the country the opportunity to take action in their communities where water meets land) in Sault Ste. Marie and result in reduced trash along and within Sault Ste. Marie and area waterways. Two complimentary events for this project include a guided canoe tour by the Lake Superior Watershed Conservancy which will raise greater awareness of the history of our area, indigenous knowledge and fun ways to clean up garbage inaccessible by land. As well as a Citizen Science event with demonstrations on water quality testing. In addition, a promotional film will also be created highlighting events that took place during the cleanup and water stewardship in Sault Ste. Marie. By supporting this initiative, the City of Sault Ste. Marie is also eligible to become a Clean Shoreline Community, where they can join municipalities across Canada who are addressing issues of waste and plastic pollution and helping keep litter out of nature. This project supports the Green Initiatives Program fund pillar of improving water quality / rehabilitation.

FINANCIAL IMPLICATIONS
There are sufficient funds in the 2022 Community Development Fund – Green Initiatives Fund to support the three projects in this report totalling $12,335.78. By the end of the year, any remaining funds not used must go towards the purchase of trees for the subsequent year, which trees should be planted in City Parks or on City property by Public Works employees as per a resolution from the March 9, 2020 Council Meeting.

STRATEGIC PLAN / POLICY IMPACT
The recommendations support the value and focus areas of the Community Strategic Plan for 2021 – 2024 through:

- Environmental Stewardship: We will use resources wisely to maintain and create a sustainable city for future generations

[2] Pennisi, G, Pistillo, A, Orsini, F, et al. Optimal light intensity for sustainable water and energy use in indoor cultivation of lettuce and basil under red and blue LEDs. Sci Hortic. 2020;272:109508. doi:10.1016/j.scienta.2020.109508.
[3] Stein EW. The Transformative Environmental Effects Large-Scale Indoor Farming May Have On Air, Water, and Soil. Air, Soil and Water Research. January 2021. doi:10.1177/1178622121995819

As well, the Environmental Sustainability Committee, a committee of council has as an objective to review and recommend funding applications to the Community Development Fund for Environmental Sustainability projects and support local initiatives that promote environmental sustainability.

RECOMMENDATION

It is therefore recommended that Council take the following action:

Resolved that the report of the Sustainability Coordinator dated June 13, 2022 concerning 2022 05 24_CDF GRI May Applications v1.docx be received, and that the recommendation to support the three projects as follows:

1. City of Sault Ste. Marie Stormwater Art Project in the amount of $3,355.00
2. YMCA Aeroponic Tower Garden Project in the amount of $4,051.05
3. Blue Mar 4 Change Shoreline Cleanup Project in the amount of $4,929.73

be approved.

Respectfully submitted,

Emily Cormier
Sustainability Coordinator
Community Development &
Enterprise Services
(705) 989-8748
e.cormier2@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Maggie McAuley, Municipal Services Engineer
DEPARTMENT:	Public Works and Engineering Services
RE:	Miscellaneous Construction and Paving–Contract 2022-10E

Purpose

The purpose of this report is to obtain approval to award Contract 2022-10E. The work generally consists of supplying all materials, labour and equipment necessary for the resurfacing of Wellington Street West from Lyons Avenue to Henrietta Avenue; Second Line West from Third Avenue to Edison Avenue; conversion of surface treatment to Class 'B' of Moss Road from Korah Road to Third Line; crack sealing various locations; installation of PXO at various locations; upgrades to Senior Centre Parking Lot - 615 Bay Street; and surface treatment of various locations within the City.

Background

At the May 2, 2022 meeting, Council approved the 2022 Resurfacing Program.

Tenders received via email for Contract 2022-10E were opened Thursday, June 2, 2022 at the Civic Centre. Present at the opening was the City Clerk as well as City staff. Results were posted on the City website immediately following.

Analysis

A total of two (2) tenders were received. All tenders submitted were checked by City staff and found to be complete and valid. The low tender of $2,783,638.69 (excluding HST) was received from Avery Construction Ltd.

Financial Implications

In the 2022 miscellaneous construction budget, $851,000 is available for resurfacing and surface treatment. There remains $170,372 from the allocation for resurfacing in the 2022 Capital Transportation Plan after the award of Contract 2022-13E. There is OCIF top up of $345,000 allocated to resurfacing, and finally, there is an allocation for the Senior's Centre Parking Lot of $420,000, for a total miscellaneous construction and paving budget of $1,786,372.

Excluding the Northern Ontario Resource Development Support Fund (NORDS) funded resurfacing project, when Prince Township costs are removed and non-recoverable HST is added, the cost to complete this project is projected to be

$2,015,009. The $228,636 overrun can be covered from uncommitted available overall capital funds.

Also included is the resurfacing project funded by NORDS. The 2021 and 2022 allocations are available in the amount of $800,000. The resurfacing of Second Line West is the City's approved NORDS project which was included in this tender and valued at $658,578. The limits of the tender will be extended in order to maximize the funding.

Strategic Plan / Policy Impact
This report is linked to the new infrastructure focus area of the strategic plan

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Municipal Services Engineer dated June 13, 2022, concerning the Miscellaneous Construction and Paving Contract be received and that Contract 2022-10E be awarded to Avery Construction Ltd.

By-law 2022-125 authorizing execution of Contract 2022-10E appears elsewhere on the Agenda and is recommended for approval

Respectfully submitted,

Maggie McAuley, P. Eng.
Municipal Services Engineer
705.759.5385
m.mcauley@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Maggie McAuley, Municipal Services Engineer
DEPARTMENT:	Public Works and Engineering Services
RE:	Resurfacing Contract – Contract 2022-13E

Purpose

The purpose of this report is to obtain approval to award Contract 2022-13E. The work generally consists of supplying all materials, labour and equipment necessary for the resurfacing of McNabb Street from Pine Street to Lake Street; St. Georges Avenue from John Street to Birch; and Wellington Street East near Bruce Street.

Background

At the May 2, 2022 meeting, Council approved the 2022 Resurfacing Program.

Tenders received via email for Contract 2022-13E were opened Tuesday, May 30, 2022 at the Civic Centre. Present at the opening was the Deputy City Clerk as well as City staff. Results were posted on the City website immediately following.

Analysis

A total of two (2) tenders were received. All tenders submitted were checked by City staff and found to be complete and valid. The low tender of $2,024,005.22 (excluding HST) was received from Ellwood Robinson Incorporated.

Financial Implications

When non-recoverable HST is added, the cost to complete this project is projected to be $2,059,628. This is below the allocation in the 2022 Capital Transportation Plan of $2,230,000 for miscellaneous paving/resurfacing budget.

Strategic Plan / Policy Impact

This report is linked to the new infrastructure focus area of the strategic plan.

Recommendation

It is therefore recommended that Council take the following action:

Resolved that the report of the Municipal Services Engineer dated June 13, 2022, concerning the Resurfacing Contract, be received and that and the recommendation that Contract 2022-13E be awarded to Ellwood Robinson Incorporated be approved.

By-law 2022-126 authorizing execution of Contract 2022-13E appears elsewhere on the Agenda and is recommended for approval.

Respectfully submitted,

Maggie McAuley, P. Eng.
Municipal Services Engineer
705.759.5385
m.mcauley@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Carl Rumiel, Director of Engineering
DEPARTMENT:	Public Works and Engineering Services
RE:	Capital Road Spending Survey – Northern Municipalities

Purpose
The purpose of this report is to address the Council resolution from November 29th, 2021, which reads:

Whereas Sault Ste. Marie has approximately 1,200 road sections within City boundaries that must be maintained; and

Whereas the City's capital transportation budget is approximately $4.5 million per year; and

Whereas this amount has not increased over the last two decades; and

Whereas the overall condition of City roads continues to deteriorate as a result of an underfunded capital budget; and

Whereas City staff is currently conducting a provincially mandated asset management update of city roads maintenance requirements; and

Whereas Council should investigate and compare capital road expenditures in other northern communities, so that it has a benchmark of current practices and expenditures throughout the north

Now Therefore Be It Resolved that Council ask staff to prepare a report that compares capital reconstruction and resurfacing expenditures with other northern communities;

Further, that the report attempt to include metrics related to length of roads, total lane kilometres, surface type, relative lengths of arterials, collectors and local roads to help frame the results and add the necessary context for comparison, and that the report be presented to Council by June 2022.

Background

In December of 2021, capital road spending data was requested from Sudbury, Thunder Bay, North Bay and Timmins in order to compare other northern municipality's investment in their road infrastructure. In particular, data requested looks at comparison of average annual expenditures for road reconstruction and road resurfacing.

Analysis

Appendix A of this report shows the various metrics and road spending data provided by the five largest municipalities in Northern Ontario. Generally, the presentation of the data focuses on three main ratios: lane-meters per capita, dollars spent on roads per capita and dollars spent on roads per lane-km.

It is difficult to compare data from one municipality to another because not all variables are consistent between different locales. For example, some municipalities may be more successful in securing outside grant funding for new road construction, which is not reflected in their own capital investment. Further, road deterioration may be greater from one geographical region to another due to soil conditions. Much of Sault Ste. Marie's native soils are poorly draining silt and clay, which are extremely susceptible to differential frost movement below the road structure. This frost action causes accelerated deterioration of our roads and the need for higher spending on maintenance, resurfacing and reconstruction. A more rigorous scientific investigation utilizing geologic and geotechnical data would add to this discussion but was not included as part of this report. Another factor that could cause an imbalance between municipalities is the varying cost of materials and labour. As northern municipalities, we are somewhat geographically isolated resulting in the cost of asphalt being higher in one location than another due to trucking of materials from larger centres. It is likely that municipalities closer to southern Ontario would be able to resurface/reconstruct more lane-km's per dollar spent than one that is further away.

Sault Ste. Marie, North Bay and Thunder Bay have similar lane-meters per capita; however, Sudbury and Timmins are considerably higher, based on a much larger area covered by the municipal footprint. This lower population density may result in lower average annual daily traffic (AADT) volumes resulting in less wear and tear on a road in some areas. Of the five northern municipalities, Sault Ste. Marie appears to spend the most per lane kilometer and per capita. This may mean we concentrate more on reconstruction than resurfacing resulting in less lane-km's worked on per year, which also translates to higher dollars spent per lane-km. Sudbury spends far more on resurfacing which may be indicative of their road structures holding up or it could also indicate their asphalt surfaces are poorer thus requiring resurfacing on a more frequent basis.

Based on this data, Sault Ste. Marie compares well showing a high investment into road reconstruction and resurfacing. However, a much more in-depth comparison would be required to make conclusions that are more definitive. Apparently, all

five northern cities are facing a formidable road infrastructure deficit and in order to meet demands, increases to the resurfacing and reconstruction budgets will be required. The City's new corporate asset management plan will be completed this year related to core municipal infrastructure including inventory of roads, current levels of service, and costs to maintaining levels of service. This plan will serve as a tool in setting appropriate levels of spending on our road infrastructure.

Financial Implications
There are no immediate financial implications to this report.

Strategic Plan / Policy Impact
Capital spending on roads is linked to the infrastructure area of the corporate strategic plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Engineering dated June 13, 2022 concerning Capital Road Spending Survey – Northern Municipalities be received as information.

Respectfully submitted,

Carl Rumiel, P. Eng.
Director of Engineering
705.759.5379
c.rumiel@cityssm.on.ca

APPENDIX A

Capital Roads Spending Survey - Northern Municipalities

City		Sault Ste. Marie		Greater Sudbury		North Bay		Thunder Bay		Timmins	
Municipal Area (square km)		715		3,228		315		448		2,962	
Population		72,051		166,004		52,662		108,843		41,145	
Road	Description	Total Centerline Length (km)	Total Lane kilometers	Total Centerline Length (km)	Total Lane kilometers	Total Centerline Length (km)	Total Lane kilometers	Total Centerline Length (km)	Total Lane kilometers	Total Centerline Length (km)	Total Lane kilometers
Class A	Asphalt surface with curbs and storm sewers	276	669	n/a	976	362	833	885	1729	293	657
Class B	Asphalt surface with ditches	144	295	n/a	1397	incl above	incl above	incl above	incl above	45	116
Class C	Tar and chip surface treatment	105	210	n/a	601	incl above	incl above	incl above	8	22	43
Class D	Gravel surface	10	20	n/a	618	12	25	incl above	175	63	126
	Total	**535**	**1194**	**0**	**3592**	**374**	**858**	**885**	**1912**	**423**	**942**

Capital Expenditures (excludes maintenance):

Average annual expenditures for capital reconstruction $M (last 3-5 years) includes roadworks and storm sewers but excludes sanitary and water	$16.7	$18.0	$9.2	$11.3	$7.2
Average annual expenditure for resurfacing $M (3-5 years)	$3.5	$19	$3.9	$4.3	$2.5
Total	$20.2	$37.0	$13.1	$15.6	$9.7
Ratios:					
Lane-m per capita	16.6	21.6	16.3	17.6	22.9
$ spent per capita	280	223	249	143	236
$ spent per lane-km	$ 16,918	$ 10,301	$ 15,268	$ 8,159	$ 10,297

Updated June 8, 2022

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Carl Rumiel, Director of Engineering
DEPARTMENT:	Public Works and Engineering Services
RE:	Strategies for Managing Traffic Speed

Purpose

The purpose of this report is to address the Council resolution from September 13th, 2021, which reads:

Whereas the Sault Ste. Marie Police Service has also expressed that there are increased complaints about speeding and that excessive speeding has become a community-wide concern; and

Whereas higher speeds contribute to higher risk of serious injuries and fatalities for pedestrians, cyclists and motorists; and

Whereas many communities globally have addressed the issues by undertaking a Vision Zero Strategy or creating a holistic Community Road Safety Strategy and Speed Management Strategies which include speed limit reductions, automated speed enforcement, road design improvements, public transportation improvements and public engagement campaigns;

Now Therefore Be it Resolved that staff, along with the Sault Ste. Marie Police Service and any other required organizations, review and report on the best strategies for addressing these issues and present a plan for implementation.

Background

In response to Council's resolution and increasing public concern regarding speeding in the community, City and Sault Ste. Marie Police Services (SSMPS) staff met to begin to organize an inter-departmental approach to address the matter. The first meeting took place in January of 2022 and next steps are drafted in the Analysis section of this report.

Analysis

The Task Force has determined that there are several components to the speed management strategy, which will form this multi-tiered holistic approach to the managing traffic speed.

1) Establishment of a Speeding Task Force – This task force shall have representation from Police Services, Public Works and Engineering Services Department, and Clerk's Division (Communications). The Manager of Design and Transportation Engineering will be the Chair for this task force and meetings shall occur quarterly. Part of the mandate of this task force shall be to consider speed management on a City-wide basis and keep aligned with Vision Zero Strategies which include the elimination of traffic fatalities/injuries while increasing safe, healthy, and equitable mobility for all. This may be integrated into a Vision Zero Plan, should the City officially adopt one.

2) Data Collection – Data will be collected through various means during the calendar year. City Engineering staff will collect data from areas raised as a concern from citizen complaints, Council communications and work orders. There is also a pilot project, which utilize scanners mounted on streetlights that the City is working with the PUC and SSMPS. In this project, data will be collected on a broader scale for arterial and collector roads that have been raised as potential roadways with speeding concerns.

3) Data Analysis – Data will be reviewed, analyzed and presented by the Task Force to better define the issues. Key target areas will be defined for Police Enforcement and to better identify topics for public education campaigns (i.e. school zones, pedestrian crossovers, traffic calming etc.). All speed management strategies will be thoroughly examined and considered including, but not limited to, road geometric improvements, traffic calming tools, radar display devices, red light cameras and photo radar enforcement as part of the overall approach.

4) Public Education Campaign – Keeping in line with other Ontario Municipalities and Vision Zero strategies, currently there are education campaigns by Police Services and the City has joined the PUC in recent summers in an effort to educate the public on the importance of slowing down in construction zones to keep our workers safe. The key pillars of the City of Sault Ste. Marie's Public Education campaigns will be determined upon review of the data in 2022 and presented for Council's support as the Task Force's work continues. This Task Force will make recommendations on what the pillars will be.

5) Reporting to Council – Staff will provide a report in the fall of 2022 outlining progress on the project. On going, an annual or semi-annual report outlining

the status of the Task Force's effort for the year will be presented to Council for their information.

Financial Implications
There are no immediate financial implications to this report; however, future speed management improvements may result in additional capital and operation requests at budget time. Existing resources and budgets will be utilized during 2022 with submissions made to the 2023 budget deliberations should the need for additional resources be identified.

Strategic Plan / Policy Impact
Management of traffic speed is linked to the infrastructure and quality of life focus areas of the corporate strategic plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Engineering dated June 13, 2022 concerning Strategies for Managing Traffic Speed be received as information and that Council support, in principle, the recommendation of the multi-tiered, holistic approach to managing traffic speed outlined in this report.

Respectfully submitted,

Carl Rumiel, P. Eng.
Director of Engineering
705.759.5379
c.rumiel@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Carl Rumiel, Director of Engineering
DEPARTMENT:	Public Works and Engineering Services
RE:	Brock Street Road Closure - Extension

Purpose
The purpose of this report is to obtain Council approval to extend the duration of the closure of Brock Street until the end of August.

Background
At the meeting of Council on February 22, 2022 Council approved the closure of Brock Street just north of Albert Street until June 1st to facilitate construction of a new Social Services (Ontario Works, Early Years and Housing) building.

Analysis
The general contractor, Matheson Constructors, has requested that the road closure be extended until August 31st. The primary reason for the extension is due to work stoppages caused by strike action in the province by labour and trade unions in both residential and commercial construction sectors.

Financial Implications
There are no financial implications to this report.

Strategic Plan / Policy Impact
Closure of a public road in order to facilitate building construction is unrelated to a specific area of the strategic plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Director of Engineering dated June 13, 2022 concerning the closure of Brock Street, be received; and that By-law 2022-31 authorizing closure of Brock Street between the Albert Street East and the northerly laneway adjacent to Civic #181 be amended to extend the road closure to August 31, 2022 be approved.

By-law 2022-111 appears elsewhere on the agenda and is recommended for approval.

Respectfully submitted,

Carl Rumiel, P. Eng.
Director of Engineering
705.759.5379
c.rumiel@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Nicole Maione, Manager of Transit & Parking
DEPARTMENT:	Community Development and Enterprise Services
RE:	Municipal Law & By-Law Enforcement Officers

PURPOSE

The purpose of this report is to update By-law 90-305, which appoints municipal law enforcement officers, and to update By-law 93-165 which appoints municipal by-law enforcement officers.

BACKGROUND

By-Law 90-305 is a By-law appointing municipal law enforcement officers and is amended from time to time. By-law 93-165 is a By-law appointing municipal by-law enforcement officers and is amended from time to time.

ANALYSIS

Not applicable.

FINANCIAL IMPLICATIONS

There is no budgetary impact.

STRATEGIC PLAN / POLICY IMPACT

This is an operational activity not articulated in the strategic plan.

RECOMMENDATION

It is therefore recommended that Council take the following action:

By-law 2022-114 appears elsewhere on the Agenda and is recommended for approval.

By-law 2022-115 appears elsewhere on the Agenda and is recommended for approval.

Respectfully submitted,

Nicole Maione
Manager of Transit and Parking
705.759.5434
n.maione@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Peter Johnson, Fire Chief
DEPARTMENT:	Fire Services
RE:	Fire Service By-Law Updates

Purpose
The purpose of this report is to notify the Mayor and members of Council of updates to applicable Fire Service by-laws.

Background
A report from the Fire Chief dated June 25, 2018 was presented on the Council agenda. The report contained multiple applicable Fire Service by-laws. Recently, due to retirements, the individuals named in the by-laws have changed and revisions are required.

Analysis
The Municipal Act, 2001 requires a municipality to enact a number of by-laws to operate the municipality and specifically their fire department. In addition to meeting this legislative responsibility, by-laws provide the community with important information with regard to the level of service that a municipality intends to provide. By-laws also provide municipal staff with the authorization to provide these services as well as the responsibility to achieve the prescribed service level.

The updates include the following:

By-law 2022-109 Appointment by-law for Deputy Chief Fire Operations, Training and Logistics as Deputy Chief Mike Oliverio.

By-law 2022-110 Appointment by-law for Fire Prevention Officers containing the following new Fire Prevention Officers - Dave Kochanowski, Naomi Thibault and Craig Genys.

Financial Implications
There is no financial impact.

Strategic Plan / Policy Impact
Service Delivery - the by-laws contained in this report will ensure that the City of Sault Ste. Marie Fire Service will continue to provide efficient and effective service to the community, resulting in excellent customer service.

Recommendation
It is therefore recommended that Council take the following action:

By-law 2022-109, an appointment by-law for the current Deputy Chief Fire Operations, Training and Logistics, and By-law 2022-110, an appointment by-law for Fire Prevention Officers are listed under item 11 of the Agenda and will be read with all by-laws under that item.

Respectfully submitted,

Peter Johnson
Fire Chief
705.949.3333
p.johnson@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Melanie Borowicz-Sibenik, Assistant City Solicitor/ Senior Litigation Counsel
DEPARTMENT:	Legal Department
RE:	Part 15 Creery Avenue Sale to Chris Briel

PURPOSE

The purpose of this report is to advise Council of the offer received for the sale of part of 15 Creery Avenue (30 feet running the length of abutting property).

ATTACHMENT

Attached as Schedule “A” is a map of the subject property (“Property”).

BACKGROUND

On March 21, 2022, Council passed By-law 2022-46 which declared the Property surplus to the City’s needs and approved the disposition of same.

The abutting property owner, Chris Briel, provided the Legal Department with a Letter of Opinion from Samanda Butkovich, Broker at Re/Max Sault Ste. Marie. The Opinion provided that the Property has a Market Value of One Thousand One Hundred ($1,100.00) Dollars. Chris Briel has advised he intends to use the Property to extend parking space in the rear of the building located at 186 Breton Road.

The sale of the Property was advertised in the Sault Star on March 26, 2022 and on the City’s web page advising that the City wished to sell to the abutting owner. No comments or objections were received.

ANALYSIS

If the City decides to dispose of the Property, it would be consistent with the City’s plan to dispose of surplus property.

FINANCIAL IMPLICATIONS / POLICY IMPACT

As this property is presently City owned the City does not receive any revenues from taxes. Upon sale of the Property, it may be assessable depending on its ultimate use.

COUNCIL DIRECTION

It is therefore recommended that Council take the following action:

Authorize the disposition of the City owned property described as Part PIN 31523-0147 (LT) PCL 9182 SEC AWS; BLK A PL M381 ST. MARY'S; S/T LT109849; SAULT STE. MARIE, being part of 15 Creery Avenue (30 feet running the length of abutting property) in accordance with the City's policy for the disposition of land, to the abutting owner, specifically Chris Briel, for the amount of One Thousand One Hundred ($1,100.00) Dollars.

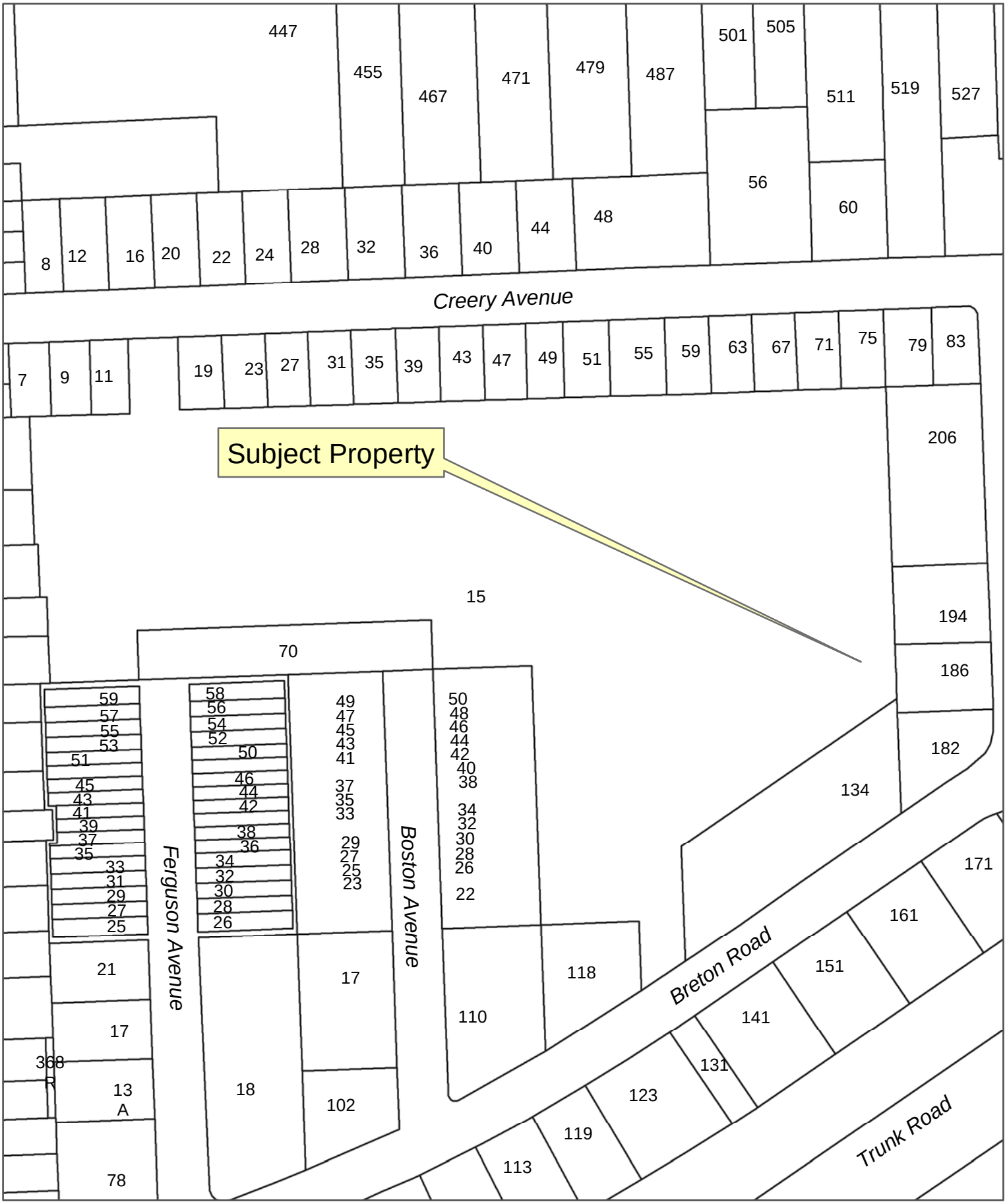
By-law 2022-121 authorizing same appears elsewhere on the Agenda and is recommended for approval.

Respectfully submitted,

Melanie Borowicz-Sibenik
Assistant City Solicitor/Senior Litigation Counsel
MBS/lv
Attachment

\\citydata\LegalDept\Legal\Staff\COUNCIL\REPORTS\2022\15 Creery Ave (Part) Sale to Briel OPEN.docx

Schedule "A"



MAP TITLE

MAP PURPOSE/DESCRIPTION

The Corporation of the City of Sault Ste. Marie
Legal Department
June 17, 2015

This map is for general reference only.
For official mapping, see the
Engineering and Planning Department.
Orthophotos: None

Projection Details:

NAD 1983 UTM Zone 16N
GCS North American 1983

Parcel Fabric

0 15 30 60 Meters

1:2,000

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Melanie Borowicz-Sibenik, Assistant City Solicitor/ Senior Litigation Counsel
DEPARTMENT:	Legal Department
RE:	Declare 97 Victoria Street Surplus

PURPOSE

The purpose of this report is to recommend to Council that the property described as PIN 31613-0179 (LT) LT 43 PL 58 AWENGE; SAULT STE. MARIE, being 97 Victoria Street ("Property") be declared surplus and offered for sale by the City in accordance with the City's policy for the disposition of land.

ATTACHMENT

Attached as Schedule "A" is a map of the Property.

BACKGROUND

The Legal Department received a request on June 10, 2021 from Kenny Pierman (Exit Realty) on behalf of his client Judy O'Neil to ascertain if the Property could be declared surplus. The request was circulated to various City Departments, the District of Sault Ste. Marie Social Services Administration Board ("DSSMSSAB") and the Sault Ste. Marie Region Conservation Authority ("SSMRCA") for comment.

The Public Works Department, Planning Department, Community Development and Enterprise Services Department, Building Department, Engineering Department and DSSMSSAB have no issue with declaring the Property surplus. Building and Planning both advised that 97 Victoria Street cannot be developed on its own and it is their recommendation that it be sold to an abutting owner. Judy and Rick O'Neill are abutting owners, owning the property located at 99 Victoria Street.

The SSMRCA advised that the Property is located within an area under the jurisdiction of the Conservation Authority, with regard to O. Reg. 176/06 for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses. Any proposed development on the Property will require a site plan review and may require a permit from SSMRCA. SSMRCA has no objection to the proposed sale of the Property.

ANALYSIS
If Council declares the Property surplus, the Property will be advertised once in the Sault Star and also appear on the City's web page with the notation that it will be sold to the abutting property owner.

FINANCIAL IMPLICATIONS / POLICY IMPACT
If the City decides to dispose of the Property, it would be consistent with the City's plan to dispose of surplus property. As this property is presently City owned the City does not receive any revenues from taxes. Upon sale of the Property it may be assessable depending upon its ultimate use.

COUNCIL DIRECTION
It is therefore recommended that Council take the following action:

Authorize that the City owned property described as PIN 31613-0179 (LT) LT 43 PL 58 AWENGE; SAULT STE. MARIE, being 97 Victoria Street, be declared surplus to the City's needs and authorize the disposition of the said property in accordance with the City's policy for the disposition of land, to the abutting owner.

By-law 2022-122 authorizing same appears elsewhere on the Agenda and is recommended for approval.

Respectfully submitted,

Melanie Borowicz-Sibenik
Assistant City Solicitor/Senior Litigation Counsel

MBS/lv
Attachment

\\citydata\LegalDept\Legal\Staff\COUNCIL\REPORTS\2022\97 Victoria Street Surplus OPEN.docx

Schedule “A”

111
107
108
104
1537
103
100
99
Subject Property
97
Victoria Street
Hess Street
145
95
Erie Street
88
133
84
85

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Don McConnell, Director of Planning and Karen Fields, City Solicitor
DEPARTMENT:	Community Development and Enterprise Services
RE:	Group Homes Report

Purpose

The purpose of this report is to respond to the following resolution that was approved at the May 24, 2022 meeting of City Council.

> Whereas group homes play an important role in providing care and treatment for their clients; and
>
> Whereas these homes are staffed by trained professionals who deal with clients on an ongoing basis; and
>
> Whereas group home staff are faced with challenging situations that, from time to time, require external support from municipal emergency services; and
>
> Whereas these situations will occasionally disrupt the day-to-day lives of local residents and create occasional safety concerns for both clients and neighbours alike; and
>
> Whereas some municipalities in Ontario have by-laws that create a minimum distance between group homes in an attempt to mitigate these situations;
>
> Now Therefore Be lt Resolved that staff be requested to research the creation of a by-law that recognizes the need for group homes in our community and establishes a buffer between them and report back to Council on June 13, 2022.

Background

Staff have been asked to provide a report about the feasibility of preparing a By-law to create a minimum separation distance between Group Homes as a way of mitigating some of the situations that can arise which disrupt the lives of local residents and create occasional safety concerns for both clients and neighbours alike. It is also recognized that Group Homes are important to the community and that many Group Homes do not provide any challenges to a neighbourhood. This request is to try and alleviate a situation where multiple homes within close proximity may cause potential issues for the neighbourhood.

The request is made to alleviate a negative situation occurring in a specific neighbourhood where two group homes are located close to each other, however a by-law will affect all Group Homes and may result in a by-law that excludes people from housing on the basis of Ontario *Human Rights Code* ("the Code") protected grounds, and would result in the longstanding jurisprudence prohibiting zoning by-laws from "people zoning".

<u>Planning Considerations</u>

Section 1.4 of the Provincial Policy Statement, 2020 states:

> 1.4.3 Planning authorities shall provide for an appropriate range and mix of *housing options* and densities to meet projected market-based and affordable housing needs of current and future residents of the *regional market area* by:
>
> b) permitting and facilitating:
> 1. all *housing options* required to meet the social, health, economic and well-being requirements of current and future residents, including *special needs* requirements and needs arising from demographic changes and employment opportunities; and

The PPS defines special needs as:

> **Special needs:** means any housing, including dedicated facilities, in whole or in part, that is used by people who have specific needs beyond economic needs, including but not limited to, needs such as mobility requirements or support functions required for daily living. Examples of *special needs* housing may include, but are not limited to long-term care homes, adaptable and accessible housing, and housing for persons with disabilities such as physical, sensory or mental health disabilities, and housing for older persons.

In part, the City satisfies this requirement by permitting group homes in residentially zoned areas.

The Zoning By-law distinguishes between small and large group homes. A Group Home is up to 8 persons. A facility of more than 8 residents is defined as a Group Residence. The Zoning By-law definitions are:

> ***1.44 GROUP HOME***
> An establishment that is operated through the authority of the Government of Canada, the Province of Ontario, or the City of Sault Ste. Marie, and is designed for the **accommodation of 3 to 8 people**, not including staff, living under supervision in a single housekeeping unit and who by reason of their emotional, mental, social, or physical condition, or legal status, require a group living arrangement for their well-being.
>
> ***1.45 GROUP RESIDENCE***
> An establishment that is operated through the authority of the Government of Canada, the Province of Ontario, or the City of Sault Ste. Marie, and designed for the **accommodation of more than 8 people**, not including staff, living under supervision in a single housekeeping unit and who by reason of their emotional, mental, social, or physical condition, or legal status, require a group living arrangement for their well-being. All *Group Residences* are subject to site plan control.

Group Homes are permitted in all residential zones except mobile parks. Group Residences are permitted in R3 (Low Density Residential), R4 (Medium Density Residential) and R5 (High Density Residential) zones.

The City of Burlington defines both a Group Home and a Correctional Group Home and has set out a requirement of a minimum distance of 400 meters. Several other Ontario municipalities have attempted to include a minimum distance separation requirement between group homes as discussed further under Legal Considerations.

The City of Oshawa had their zoning by-law challenged to the then OMB, however, the City amended their by-law before a decision needed to be made in that case. In the preliminary hearing, the Board advised the parties at the outset that “the Board cautioned all parties that the “Planning” Act does not permit the zoning of people”.

<u>Accessibility</u>

In the City of Sault Ste. Marie’s Accessibility Plan, it states: “The City is committed to meeting the needs of persons with disabilities in a timely manner and shall do so by preventing and removing barriers to accessibility in customer service, information and communication, employment, built environment and transportation. The City is further committed to meeting the requirements of applicable legislation, including the AODA and the Ontario Human Rights Code.”

Limiting a person's choice of residence given that some disabled people require a group home environment for their well-being is contrary to the City's Accessibility Plan.

Legal Considerations

In 2010, a group of eight individuals brought Applications to the Ontario Human Rights Tribunal to challenge the Mandatory Separation Distances ("MSD") in the zoning by-laws. Sarnia amended their by-law as soon as they were served with the Application. Kitchener amended theirs in 2012. Toronto defended and after not being successful on a preliminary motion at the tribunal nor at Divisional Court they also amended their by-law in 2014. Smith Falls reached a settlement with the applicants in 2014, the terms of which were made into an Order by the Tribunal. One of the terms of Settlement, was to remove the MSD from the zoning by-law.

After that, (in 2014) the Human Rights Legal Support Centre spokesperson stated that they call on every municipality to amend their bylaws and remove arbitrary barriers and focus on inclusion of people with disabilities in every community. She noted that hundreds of municipalities have such exclusions on their books – and hoped further legal action would not be necessary.

The Chief Commissioner at the time noted that applying a human rights lens to zoning requirements is a challenging but vitally important task and encouraged all municipalities to blend human rights and zoning to the benefit of neighbourhoods and residents.

Lastly, the Manitoba Court of Appeal in 1990, dealt with appeals on five by-laws that they claimed were made in bad faith and contrary to the law. The case is *Alcoholism Foundation of Manitoba v. Winnipeg (City)*. The notice of motion was for a challenge to a by-law which enacted zoning regulations of group homes for the categories of "the aged", "convalescent or disabled persons", "inmates discharged from penal institutions or in transit waiting for full release", and "persons recovering from alcohol or drug addiction". The court analyzed it to see if there was unjustified differential treatment of disadvantaged people or groups of people such that section 15 of the *Canadian Charter of Rights* would be applicable. Section 15 of the Charter is the equality rights section. It reads:

- **15 (1)** Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

In that case, the court held that the disputed by-law's wording amounts to "people" zoning and that, under the *Charter* and its current interpretations, was

objectionable and discriminatory. They provided a declaratory order that portions of the by-law dealing with care homes, neighbourhood care homes, neighbourhood rehabilitation homes, and the separate distance requirements set out in the by-law were inoperative and of no force and effect by reason of inconsistence with s. 15 (1) of the *Charter*. The court declared the wording of the by-law to be discriminatory. Further it was stated that it is simply not acceptable since the advent of the *Charter* to prohibit a use of land with reference to the attributes of those who may use it, at least where the attributes are those which distinguish members of a disadvantaged group and where there is no evidence to show that such a prohibition is one which can be demonstrably justified as reasonable in a free and democratic society.

Analysis
Should a by-law be brought forward now it would require an amendment to the Zoning By-law, which will not alleviate the current situation as zoning by-laws are not retro-active. A by-law enacted now, would not force the current situation to change or force one Group Home to move locations. It would also be subject to challenge under the *Planning Act* and the *Human Rights Code*.

The inclusion of a minimum separation distance of 400 meters will ensure that two group homes are more than 400 meters apart, but it does not really alleviate the concerns in this neighbourhood as it would not ensure that there would not be two Group Homes still in close proximity.

Lastly, all group homes are licensed and funded. For relief in this particular instance an option of reaching out to the funder to report the situation and potentially lodge a complaint with their serious occurrence or licensing and compliance group could start an investigation and possibly result in the relief that is being sought. For Ministry of Children, Community and Social Services, the following link was provided: Log in | SOR-RL: Serious Occurrence and Residential Licensing System (gov.on.ca)

Financial Implications
There is no financial impact.

Strategic Plan / Policy Impact
This is an operational matter not articulated in the Corporate Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of Director of Planning and City Solicitor dated June 13, 2022 concerning a report pertaining to the feasibility of enforcing minimum separation distances between Group Homes be received as information.

Respectfully submitted,

Donald B. McConnell
Director of Planning
705.759.5375
d.mcconnell@cityssm.on.ca

and

Karen Fields
City Solicitor
705-759-5407
k.fields@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Jonathan Kircal, Planner
DEPARTMENT:	Community Development and Enterprise Services
RE:	A-5-22-Z.OP – 865 Second Line East (Soo Auto)

Purpose
To inform City Council that the implementing by-law to rezone 865 Second Line East references the correct, current zoning of the subject property.

Background
The resolution that was passed at City Council's May 24, 2022 incorrectly identified the current zoning of the subject property as General Commercial Zone (C4).

Analysis
The Planning report titled, "A-5-22-Z.OP - 865 Second Line East – SooAuto" that was heard at City Council's May 24, 2022 meeting, incorrectly identified the current zoning of the subject property as General Commercial Zone (C4). The current zoning is Rural Area Zone (RA), which was identified in the public notice and staff report.

The by-law to implement the rezoning, which is found elsewhere in this agenda, references the correct zoning.

Financial Implications
There are no impacts to municipal finances as a result of this report.

Strategic Plan / Policy Impact
This report is not linked to any policies contained within the Corporate Strategic Plan.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Planner dated June 13, 2022 concerning A-5-22-Z.OP – 865 Second Line East (SooAuto), be received as information.

Respectfully submitted,

Jonathan Kircal
Planner
705.759.6227
j.kircal@cityssm.on.ca

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Tom Vair, Deputy CAO, Community Development and Enterprise Services
DEPARTMENT:	Community Development and Enterprise Services
RE:	Mill Market Relocation Update

Purpose

The purpose of the report is to seek Council approval to advance the project to relocate Mill Market Sault Ste. Marie (Mill Market) to 73 Brock Street.

Background

On March 23, 2020 City Council approved the acquisition of 73 Brock Street with the purpose of hosting the Mill Market. Staff engaged architects at Brook McIlroy to do a conceptual design for the building.

On February 22, 2022 City Council authorized an expenditure of up to $260,000 from the 2021 Canada Community Building Fund (CCBF) Top-Up Allocation funding to procure architectural and engineering services associated with the project.

The result of the procurement process for this work saw the City engage with MGP Architects + Engineer Inc. (MGP) in the amount of $159,500 + applicable HST.

The funding applications submitted by the Mill Market included a total project cost of $3.2M. This total project included funds for a commercial kitchen, completion of the second floor mezzanine space and an elevator. The Mill Market has learned that their application to the Infrastructure Canada Green and Inclusive Community Building Program (GICBP) for $1,750,000 was not successful. However, there is an opportunity to re-submit a project of a lower dollar value to a rolling small-medium sized project fund.

The Mill Market has been successful with a funding application to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Rural Economic Development (RED) Program for $250,000. In addition, the Mill Market is able to make a $40,000 contribution to the project from their reserve funds.

As reported to Council previously, staff have worked with the Mill Market to scope a smaller renovation project. The estimated cost of the initial building renovations and leasehold improvements is approximately $2M. MGP is finalizing the detailed drawings and preparing a tender for the work.

Prior to issuing the tender, staff are seeking Council direction and approval to advance the project.

Analysis

The Mill Market agrees that taking a phased approach to the development of the market is appropriate. The first phase is proposed to see building renovations and leasehold improvements completed that will provide an attractive and functional new market space. The second phase will be contingent on funding applications and will include amenities such as the commercial kitchen and completion of the mezzanine space in the building (including elevator).

The Mill Market will continue to pursue funding programs to assist with both the first phase and the second phase.

Staff have worked with the Mill Market to develop a path forward to enable the project to proceed under two scenarios:

1) No additional funding received
2) Additional funding received

Scenario One – No additional funding received

Under this scenario, it is proposed that the project is funded through contributions from the City and Mill Market. The Mill Market has raised $40,000 to date that they will contribute to the project. Further, the Mill Market is willing and able to pay back leasehold improvements in the amount of $410,000 over a 25 year term. The Board of the Mill Market passed a resolution which is attached for reference (Attachment A - Mill Market SSM Resolution May 2022). The City could provide the up-front capital amount of $410,000 through internal funds.

The Mill Market will be able to cover these costs through proposed rental revenue from the mobile retail units (in collaboration with the City), and costs savings achieved in the new location including the elimination of snowplowing and septic tank pump out fees.

In order to complete the building renovations to this City-owned facility, the remaining amount to be funded in this scenario is $1,300,000. It is

recommended a contingency of 5% also be included ($100,000) to cover any unforeseen project costs for a total of $1,400,000.

Summary Table:

Project Cost Estimate	**Amount**
Renovations and leasehold improvements	$ 2,000,000
Architect & Eng. Fee	$ 162,307
Contingency	$ 100,000
Total Estimate	**$ 2,262,307**
Contributions	
City Existing (Drawings)	$ 162,307
City New w. contingency	$ 1,400,000
Mill Market Contribution	$ 40,000
Mill Market Lease	$ 410,000
RED	$ 250,000
Total Contributions	**$ 2,262,307**

It should be noted, even in scenario one, through their successful funding application to the RED program, project contributions and lease payments, the Mill Market contribution will be $700,000.

Scenario Two – Additional funding is received
Under this scenario, the amount of funding received will reduce the requirement for the City to lend any funds to the market and potentially reduce the City's contribution (i.e., any funding received that reduces projects costs by over $410,000 will directly reduce the support required from the City).

Having a financing plan in place to backstop the project is required should the project come in on budget. As always, Council will have a decision point to award the tender in the future. The immediate goal is to enable the tender to be released and the project to proceed to the next stage.

The relocation of the Mill Market is seen as an important component of the downtown revitalization strategy. The building at 73 Brock Street was purchased with the intent of relocating the market as this site creates a number of positive synergies with the downtown plaza, mobile retail units and future events and programming.

In addition, the current Mill Market facility was never intentioned to be a permanent home for the market. The facility will require significant capital investment and remediation moving forward. If the facility were to remain on site, a complete building condition assessment would be required. Further, Council passed a resolution to examine opportunities to develop the Gateway site, which would necessitate a relocation of the market.

Financial Implications

City staff has reviewed different options to determine funding sources that could support the building renovations should Council wish to proceed. Under scenario one, it is recommended the funding of up to $1,400,000 ($1.3M plus contingency of $100,000) would come from the following City sources:

Asset Management Reserve	$	708,089
Community Development Fund	$	300,000
Arch. & Eng. Underage (previously approved CCBF Top-Up Allocation)	$	97,693
Remaining CCBF Top-Up Allocation	$	294,218
Total	$	1,400,000

Utilizing this recommendation would have no impact on the levy.

The City would advance the $410,000 to cover leasehold improvements to the Mill Market utilizing internal funds. The Mill Market would pay this amount back, without interest, over a 25-year period with annual contributions of $16,400.

As stated above, under scenario two, should the Mill Market be successful with its funding applications, the requirement to advance leasehold improvement funds and contribute City funds will be reduced.

Strategic Plan / Policy Impact

This acquisition aligns directly with several areas of the Corporate Strategic Plan including:

> Quality of Life – Vibrant Downtown Areas – We are striving to create a vibrant downtown that contributes to the vitality and resiliency of our City. Downtown areas play a central role in defining the character of our City. And also, “Promote and Support Arts and Culture.”
>
> Community Development and Partnerships – Develop partnerships with key stakeholders.

Recommendation
It is therefore recommended that Council take the following action:

Resolved that the report of the Deputy CAO, Community Development and Enterprise Services dated June 13, 2022 be received and City Council authorize staff to issue a tender for the renovations and leasehold improvements of 73 Brock Street to host Mill Market Sault Ste. Marie;

Further, that Council approve an expenditure of up to $1,400,000 from the sources outlined above to fund a City contribution to the project;

Further, that Council approve an advance of up to $410,000, interest free, from internal funds to cover leasehold improvements to the Mill Market which the Mill Market will pay back over a 25-year period with annual contributions of $16,400;

Further, that Council direct staff to develop a lease agreement with Mill Market Sault Ste. Marie for the 73 Brock Street facility including a collaboration on the mobile retail units to be brought back to Council for approval.

Respectfully submitted,

Tom Vair
Deputy CAO
Community Development & Enterprise Services
(705)759-5264
t.vair@cityssm.on.ca

APPENDIX A

MILL MARKET
SAULT STE. MARIE

May 31, 2022

Tom Vair
Deputy CAO
Community Development and Enterprise Services

RE: 73 Brock St. Property Funding Support

Dear Mr. Vair,

The Mill Market Sault Ste. Marie Board is pleased to provide the approved resolution below in support of the project.

> Moved by Errol Caldwell
> Seconded by Denise Martel
>
> Resolved that the Mill Market Sault Ste. Marie will commit to a twenty-five (25) year term lease at 73 Brock Street with the City of Sault Ste. Marie at project completion in the amount of $410,000 (no interest applicable - $16,400 annual). Furthermore the Market will commit $40,000 in up-front leasehold improvement costs bringing total contribution to the project at $450,000.
>
> **Carried**

Mill Market Sault Ste. Marie Board

The Corporation of the
City of Sault Ste. Marie

C O U N C I L R E P O R T

June 13, 2022

TO:	Mayor Christian Provenzano and Members of City Council
AUTHOR:	Jeffrey King Solicitor/Prosecutor
DEPARTMENT:	Legal Department
RE:	Granting Access to Neighbouring Property – River Rd.

Purpose

The purpose of this report is to seek Council's approval for a by-law made pursuant to Section 132 of the *Municipal Act, 2001* authorizing entry onto a neighbour's property for the purpose of maintenance of the single family dwelling by means of repairing siding to the dwelling.

Background

The City Legal Department was contacted in August of 2021 by Susan Drouin and Larry Drouin, owners of 323 River Road located in the City of Sault Ste. Marie (the "Drouin Property"). The Drouin's advised Legal that the single family dwelling located at the Drouin Property required maintenance to the exterior side wall in order to protect the property from elements such as rain. Following discussion with Legal, the Drouin's decided that they would attempt to receive permission to access the abutting property at 327 River Road (the "Alfano Property") without any assistance from Legal. Legal noted that the *Municipal Act* can see a by-law passed if needed.

Both parties, the Drouin's and Mr. Alfano, acknowledge that the initial contractor hired was less than professional. This contractor was terminated by the Drouin's and a new contractor retained by the Drouin's to complete the remainder of the maintenance work.

In November of 2021, after a new contractor performed work for a couple weeks without issue, the Drouin's reached out to advise that access to the Alfano Property was denied and that siding remained to be placed on one exterior wall of the house. Proper siding on a dwelling is a requirement pursuant to the City of Sault Ste. Marie's Property Standards By-law.

The City Legal Department wrote to Victor Alfano on December 15, 2021, confirming the request for access to the Alfano Property by the Drouin's for the purpose of maintenance to the remaining exterior wall without siding. The letter advised Mr. Alfano that City Council has authority under the *Municipal Act, 2001* to pass a by-law authorizing a person to go on to his neighbour's property to make

repairs to a building, fence or other structure. The letter requested that Mr. Alfano confirm whether or not he consented to access by the Drouin's contractor to the Alfano Property for the outlined purposes and advised that if consent was not provided by January 6, 2022, the matter would be brought forward to City Council.

The City Legal Department was subsequently contacted by Mr. Alfano on December 22, 2021. Mr. Alfano advised that he would not provide his consent to the access request made by the Drouin's and directed Legal staff to consult his lawyer. That same day an email highlighting the issue and the request for access was forwarded the Mr. Alfano's lawyer.

The City Legal Department contacted Mr. Alfano's lawyer in an attempt to reach a mutual understanding that would see the Drouin's contractor gain access to the Alfano property. Until the beginning of May 2022, draft agreements where circulated to the parties and conversations regarding the action of proceeding to Council should talks fail.

On May 9, 2022 it was apparent that an agreement would not be reached between the parties and that a by-law would be needed to see the remaining siding be placed on the Drouin's home. The nature of the discussion around any agreement, in-part, form the requirements and consideration as set out in the proposed by-law granting access.

An unrelated civil dispute in relation to the location of the actual property boundary exists between the Drouin property and the Alfano property. This aspect is mitigated by a recent survey performed by the Drouin's depicting the dwelling on the Drouin Property to be on the property boundary with an aerial encroachment. This survey serves as reference to determine the required access distance onto the Alfano property.

Analysis

Section 132(1) & (2) of the *Municipal Act*, *2001* gives authority to City Council to authorize the owner or occupant of land to enter adjoining land, at reasonable times and under conditions that Council may consider advisable, for the purposes of maintaining a building or structure on the land of the owner or occupant. Section 132 specifically states that such entry onto adjoining land is only to the "extent necessary to carry out the repairs or alterations".

Mr. Alfano's concerns in denying access to the Drouin's are adequately addressed by Section 132 (1) & (2) of the *Municipal Act, 2001*. Specifically, the Contractor would only be permitted to enter upon the adjoining land only "to the extent necessary to carry out the repairs or alterations" and therefore the Contractor is not permitted access to the entirety of the adjoining land. In this case, the Contractor has requested access to a distance of eight (8') feet from the property line onto the Alfano Property to complete the maintenance. Further, the City may impose time frames for completion of the work undertaken by the Contractor. The Contractor estimates that it will take two (2) weeks to complete the maintenance

work on the existing single family dwelling at the Drouin Property. Given various contingencies that may arise in construction (ie. weather, illness, construction materials, time) the by-law for consideration by Council provides the Contractor with four (4) weeks from the date of passing of the by-law to complete the requested maintenance. This time limit ends upon the completion of the requested work.

Further, Section 132(2)(5) requires the Drouins' to restore the Alfano Property to its original condition and provide compensation for any damages caused by the entry onto the adjoining lands. This is outlined in the by-law presented to Council.

The dwelling on the Drouin property has been without exterior siding since November of 2021 because of the Drouin's inability to complete this maintenance via access to the Alfano property.

Mr. Alfano has denied access for reasons of the past actions of a contractor that is no longer to complete the required work and the disputed property boundary.

A more amicable solution was attempted between the parties from January 2022 until May of 2022 when it became clear that a resolution or agreement would not be reached.

Based on the above analysis, the only means to see the Drouin property gain access to the Alfano property so that the exterior siding can be completed, is to pass a by-law enabling the required access.

Financial Implications
There is no financial impact to the City with respect to the passing of this by-law.

Strategic Plan / Policy Impact
Not applicable.

Recommendation
It is therefore recommended that Council take the following action:

By-law 2022-124 appears elsewhere on this agenda, and provides the Contractor with access to the Alfano Property located at 327 River Road for the purpose of maintenance of the siding of the existing single family dwelling at 323 River Road under conditions as set out in the by-law and is recommended for approval.

Respectfully submitted,

Jeffrey King
Solicitor/Prosecutor
705.759.2662
j.king3@cityssm.on.ca
\\citydata\LegalDept\Legal\Staff\COUNCIL\REPORTS\2022\327 River Road Neighour Access OPEN.docx

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-74

AGREEMENT: A by-law to authorize the execution of the Agreement between the City and Avery Construction Limited for the construction of the Downtown Plaza.

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, **ENACTS** as follows:

1. **EXECUTION OF DOCUMENT**

The Mayor and City Clerk are hereby authorized for and in the name of the Corporation to execute and affix the seal of the Corporation to the Agreement dated May 17, 2022 between the City and Avery Construction Limited. This Agreement is for the construction of the Downtown Plaza.

2. **SCHEDULE "A"**

Attached as Schedule “A” is the Agreement between the City and Avery Construction Limited. Copies of the Appendices to the Agreement may be viewed in the Clerk’s Department in the Agreement Section. Schedule "A" (which includes the Appendices) forms part of this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

tm\\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-74 Downtown Plaza Construction.docx

CCDC 2

Stipulated Price Contract

2020

Sault Ste. Marie Downtown Plaza

Apply a CCDC 2 copyright seal here. The application of the seal demonstrates the intention of the party proposing the use of this document that it be an accurate and unamended form of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE
CANADIAN CONSTRUCTION DOCUMENTS COMMITTEE

CCDC 2 STIPULATED PRICE CONTRACT

TABLE OF CONTENTS

AGREEMENT BETWEEN OWNER AND CONTRACTOR
A-1 The Work
A-2 Agreements and Amendments
A-3 Contract Documents
A-4 Contract Price
A-5 Payment
A-6 Receipt of and Addresses for Notices in Writing
A-7 Language of the Contract
A-8 Succession

DEFINITIONS
Change Directive
Change Order
Construction Equipment
Consultant
Contract
Contract Documents
Contract Price
Contract Time
Contractor
Drawings
Notice in Writing
Owner
Other Contractor
Payment Legislation
Place of the Work
Product
Project
Ready-for-Takeover
Shop Drawings
Specifications
Subcontractor
Substantial Performance of the Work
Supplemental Instruction
Supplier
Temporary Work
Value Added Taxes
Work
Working Day

GENERAL CONDITIONS

PART 1 GENERAL PROVISIONS
GC 1.1 Contract Documents
GC 1.2 Law of the Contract
GC 1.3 Rights and Remedies
GC 1.4 Assignment

PART 2 ADMINISTRATION OF THE CONTRACT
GC 2.1 Authority of the Consultant
GC 2.2 Role of the Consultant
GC 2.3 Review and Inspection of the Work
GC 2.4 Defective Work

PART 3 EXECUTION OF THE WORK
GC 3.1 Control of the Work
GC 3.2 Construction by the Owner or Other Contractors
GC 3.3 Temporary Work
GC 3.4 Construction Schedule
GC 3.5 Supervision
GC 3.6 Subcontractors and Suppliers
GC 3.7 Labour and Products
GC 3.8 Shop Drawings

PART 4 ALLOWANCES
GC 4.1 Cash Allowances
GC 4.2 Contingency Allowance

PART 5 PAYMENT
GC 5.1 Financing Information Required of the Owner
GC 5.2 Applications for Payment
GC 5.3 Payment
GC 5.4 Substantial Performance of the Work and Payment of Holdback
GC 5.5 Final Payment
GC 5.6 Deferred Work
GC 5.7 Non-conforming Work

PART 6 CHANGES IN THE WORK
GC 6.1 Owner's Right to Make Changes
GC 6.2 Change Order
GC 6.3 Change Directive
GC 6.4 Concealed or Unknown Conditions
GC 6.5 Delays
GC 6.6 Claims for a Change in Contract Price

PART 7 DEFAULT NOTICE
GC 7.1 Owner's Right to Perform the Work, Terminate the Contractor's Right to Continue with the Work or Terminate the Contract
GC 7.2 Contractor's Right to Suspend the Work or Terminate the Contract

PART 8 DISPUTE RESOLUTION
GC 8.1 Authority of the Consultant
GC 8.2 Adjudication
GC 8.3 Negotiation, Mediation and Arbitration
GC 8.4 Retention of Rights

PART 9 PROTECTION OF PERSONS AND PROPERTY
GC 9.1 Protection of Work and Property
GC 9.2 Toxic and Hazardous Substances
GC 9.3 Artifacts and Fossils
GC 9.4 Construction Safety
GC 9.5 Mould

PART 10 GOVERNING REGULATIONS
GC 10.1 Taxes and Duties
GC 10.2 Laws, Notices, Permits, and Fees
GC 10.3 Patent Fees
GC 10.4 Workers' Compensation

PART 11 INSURANCE
GC 11.1 Insurance

PART 12 OWNER TAKEOVER
GC 12.1 Ready-for-Takeover
GC 12.2 Early Occupancy by the Owner
GC 12.3 Warranty

PART 13 INDEMNIFICATION AND WAIVER
GC 13.1 Indemnification
GC 13.2 Waiver of Claims

CCDC 2 is the product of a consensus-building process aimed at balancing the interests of all parties on the construction project. It reflects recommended industry practices. The CCDC and its constituent member organizations do not accept any responsibility or liability for loss or damage which may be suffered as a result of the use or interpretation of CCDC 2.

CCDC Copyright 2020
Must not be copied in whole or in part without the written permission of the CCDC.

AGREEMENT BETWEEN OWNER AND CONTRACTOR
For use when a stipulated price is the basis of payment.

This Agreement made on May day of 17 in the year 2022 .
by and between the parties

The Corporation of the City of Sault Ste. Marie

hereinafter called the "*Owner*"

and

Avery Construction Limited

hereinafter called the "*Contractor*"

The *Owner* and the *Contractor* agree as follows:

ARTICLE A-1 THE WORK

The *Contractor* shall:

1.1 perform the *Work* required by the *Contract Documents* for *(insert below the description or title of the Work)*

Downtown Plaza in Sault Ste. Marie

located at *(insert below the Place of the Work)*

Lands comprising the Downtown Plaza as per attached Schedule

for which the Agreement has been signed by the parties, and for which *(insert below the name of the Consultant)*

Brook McIlroy

is acting as and is hereinafter called the "*Consultant*" and

1.2 do and fulfill everything indicated by the *Contract Documents*, and

1.3 commence the *Work* by the 6 day of May in the year 2022 and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents*, attain *Ready-for-Takeover*, by the ~~30~~ 10 day of ~~December~~ February in the year ~~2022~~ 2023.

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

2.1 The *Contract* supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the *Work*, including the bid documents that are not expressly listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS.

2.2 The *Contract* may be amended only as provided in the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

ARTICLE A-3 CONTRACT DOCUMENTS

3.1 The following are the *Contract Documents* referred to in Article A-1 of the Agreement – THE WORK:

- Agreement between *Owner* and *Contractor*
- Definitions
- General Conditions
- *

1. Section 00 01 15 List of Drawings

2. Specifications as listed in Section 00 01 10 of the project manual for this project

3. Schedules as listed in Section 00 01 10 of the project manual and as listed in the list of drawings.

4. Section 00 21 13 Instructions to Bidders.

5. Section 00 31 00 Information Available for Review.

6. Section 00 41 13 Stipulated Price Bid Form.

7. Section 00 43 22 Unit Prices Bid Form Supplement.

8. Section 00 43 23 Alternative Prices Bid Form Supplement.

9. Section 00 43 36 List of Subcontractors Bid Form Supplement.

10. Addenda 1-4 issued prior to Bid Closing Time

11. Addenda 5 issued post Bid Closing Time regarding alternates. Refer to attached "Project No. 2022-CDC-PE-02-T, Downtown Plaza- Savings Rev 6" (Wednesday April 27, 2022)

* *(Insert here, attaching additional pages if required, a list identifying all other Contract Documents e.g. supplementary conditions; Division 01 of the Specifications - GENERAL REQUIREMENTS; Project information that the Contractor may rely upon; technical Specifications, giving a list of contents with section numbers and titles, number of pages and date; material finishing schedules; Drawings, giving drawing number, title, date, revision date or mark; addenda, giving title, number, date; time schedule)*

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

ARTICLE A-4 CONTRACT PRICE

4.1 The *Contract Price*, which excludes *Value Added Taxes*, is:

eight million five hundred ninety-four thousand five hundred thirty dollars and seventy-one cents	/100 dollars	$	8,594,530.71

4.2 *Value Added Taxes* (of 13 %) payable by the *Owner* to the *Contractor* are:

one million one hundred seventeen thousand two hundred eighty-eight dollars and ninety-nine cents	/100 dollars	$	1,117,288.99

4.3 Total amount payable by the *Owner* to the *Contractor* for the *Work* is:

nine million seven hundred eleven thousand eight hundred nineteen dollars and seventy cents	/100 dollars	$	9,711,819.70

4.4 These amounts shall be subject to adjustments as provided in the *Contract Documents*.

4.5 All amounts are in Canadian funds.

ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents* and *Payment Legislation*, and in accordance with legislation and statutory regulations respecting holdback percentages, the *Owner* shall:

.1 make progress payments to the *Contractor* on account of the *Contract Price* when due in the amount certified by the *Consultant* unless otherwise prescribed by *Payment Legislation* together with such *Value Added Taxes* as may be applicable to such payments,

.2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment, and

.3 upon the issuance of the final certificate for payment, pay to the *Contractor* the unpaid balance of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payment.

5.2 Interest

.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by adjudication, arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:
(1) 2% per annum above the prime rate for the first 60 days.
(2) 4% per annum above the prime rate after the first 60 days.
Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by
(Insert name of chartered lending institution whose prime rate is to be used)

for prime business loans as it may change from time to time.

.2 Interest shall apply at the rate and in the manner prescribed by paragraph 5.2.1 of this Article on the settlement amount of any claim in dispute that is resolved either pursuant to Part 8 of the General Conditions – DISPUTE RESOLUTION or otherwise, from the date the amount would have been due and payable under the *Contract*, had it not been in dispute, until the date it is paid.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

6.1 *Notices in Writing* will be addressed to the recipient at the address set out below.

6.2 The delivery of a *Notice in Writing* will be by hand, by courier, by prepaid first class mail, or by other form of electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender.

6.3 A *Notice in Writing* delivered by one party in accordance with this *Contract* will be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by mail it will be deemed to have been received five calendar days after the date on which it was mailed, provided that if either such day is not a *Working Day*, then the *Notice in Writing* will be deemed to have been received on the *Working Day* next following such day.

6.4 A *Notice in Writing* sent by any form of electronic communication will be deemed to have been received on the date of its transmission provided that if such day is not a *Working Day* or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it will be deemed to have been received at the opening of business at the place of receipt on the first *Working Day* next following the transmission thereof.

6.5 An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this Article.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

Owner

The Corporation of the City of Sault Ste. Marie

*name of Owner**

99 Foster Drive
Sault Ste. Marie, ON P6A 5X6
address

email address

Contractor

Avery Construction Limited

*name of Contractor**

940 Second Line West
Sault Ste. Marie, ON P6C 2L3
address

adam@averyconstruction.ca
email address

Consultant

Brook McIlroy

*name of Consultant**

161 Spadina Ave, 2nd Floor
Toronto ON M5V 2L5
address

tclarke@brookmcilroy.com
email address

** If it is intended that a specific individual must receive the notice, that individual's name shall be indicated.*

ARTICLE A-7 LANGUAGE OF THE CONTRACT

7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English / French # language shall prevail.
 # Complete this statement by striking out inapplicable term.

7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

ARTICLE A-8 SUCCESSION

8.1 The *Contract* shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors, and assigns.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

WITNESS

OWNER

The Corporation of the City of Sault Ste. Marie

name of Owner

signature

signature

name of person signing

name and title of person signing

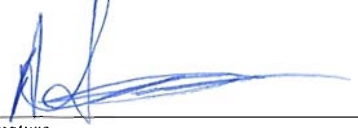
WITNESS

CONTRACTOR

Avery Construction Limited

Avery Construction Ltd.
name of Contractor

signature


signature

Adam Pinder
name of person signing

Adam Lyons, Director
name and title of person signing

N.B. *Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:*

(a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or

(b) the affixing of a corporate seal, this Agreement should be properly sealed.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

DEFINITIONS

The following Definitions shall apply to all *Contract Documents*.

Change Directive

A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon adjustments in the *Contract Price* and the *Contract Time*.

Change Order

A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:

- a change in the *Work*;
- the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
- the extent of the adjustment in the *Contract Time*, if any.

Construction Equipment

Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.

Consultant

The *Consultant* is the person or entity engaged by the *Owner* and identified as such in the Agreement. The *Consultant* is the Architect, the Engineer or entity licensed to practise in the province or territory of the *Place of the Work*.

Contract

The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.

Contract Documents

The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS and amendments agreed upon between the parties.

Contract Price

The *Contract Price* is the amount stipulated in Article A-4 of the Agreement – CONTRACT PRICE.

Contract Time

The *Contract Time* is the time from commencement of the *Work* to the date of *Ready-for-Takeover* as stipulated in paragraph 1.3 of Article A-1 of the Agreement – THE WORK .

Contractor

The *Contractor* is the person or entity identified as such in the Agreement.

Drawings

The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location and dimensions of the *Work*, generally including plans, elevations, sections, details, and diagrams.

Notice in Writing

A *Notice in Writing*, where identified in the *Contract Documents*, is a written communication between the parties or between them and the *Consultant* that is transmitted in accordance with the provisions of Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

Owner

The *Owner* is the person or entity identified as such in the Agreement.

Other Contractor

Other Contractor means a contractor, other than the *Contractor* or a *Subcontractor*, engaged by the *Owner* for the *Project*.

Payment Legislation

Payment Legislation means such legislation in effect at the *Place of the Work* which governs payment under construction contracts.

Place of the Work

The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

Product

Product or Products means material, machinery, equipment, and fixtures forming part of the *Work*, but does not include *Construction Equipment*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

Project

The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.

Ready-for-Takeover

Ready-for-Takeover shall have been attained when the conditions set out in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER have been met, as verified by the *Consultant* pursuant to paragraph 12.1.4.2 of GC 12.1 – READY-FOR-TAKEOVER.

Shop Drawings

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the *Work*.

Specifications

The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, quality, and the services necessary for the performance of the *Work*.

Subcontractor

A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work* at the *Place of the Work*.

Substantial Performance of the Work

Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*.

Supplemental Instruction

A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models, or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.

Supplier

A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products*.

Temporary Work

Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.

Value Added Taxes

Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which have been imposed on the *Contractor* by tax legislation.

Work

The *Work* means the total construction and related services required by the *Contract Documents*.

Working Day

Working Day means a day other than a Saturday, Sunday, statutory holiday, or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GENERAL CONDITIONS

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the *Contract Documents* is to include the labour, *Products* and services necessary for the performance of the *Work* by the *Contractor* in accordance with these documents. It is not intended, however, that the *Contractor* shall supply products or perform work not consistent with, not covered by, or not properly inferable from the *Contract Documents*.

1.1.2 The *Contract Documents* are complementary, and what is required by one shall be as binding as if required by all. Performance by the *Contractor* shall be required only to the extent consistent with the *Contract Documents*.

1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating co-ordination and execution of the *Work* by the *Contractor*.

1.1.4 The *Contractor* is not responsible for errors, omissions or inconsistencies in the *Contract Documents*. If there are perceived errors, omissions or inconsistencies discovered by or made known to the *Contractor*, the *Contractor* shall promptly report to the *Consultant* and shall not proceed with the work affected until the *Contractor* has received corrected or additional information from the *Consultant*.

1.1.5 If there is a conflict within the *Contract Documents*:

.1 the order of priority of documents, from highest to lowest, shall be

- the Agreement between *Owner* and *Contractor*,
- the Definitions,
- Supplementary Conditions,
- the General Conditions,
- Division 01 of the *Specifications*,
- technical *Specifications*,
- material and finishing schedules,
- the *Drawings*.

.2 *Drawings* of larger scale shall govern over those of smaller scale of the same date.

.3 dimensions shown on *Drawings* shall govern over dimensions scaled from *Drawings*.

.4 amended or later dated documents shall govern over earlier documents of the same type.

.5 noted materials and annotations shall govern over graphic indications.

1.1.6 Nothing contained in the *Contract Documents* shall create any contractual relationship between:

.1 the *Owner* and a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.

.2 the *Consultant* and the *Contractor*, a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.

1.1.7 Words and abbreviations which have well known technical or trade meanings are used in the *Contract Documents* in accordance with such recognized meanings.

1.1.8 References in the *Contract Documents* to the singular shall be considered to include the plural as the context requires.

1.1.9 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*.

1.1.10 *Specifications*, *Drawings*, models, and copies thereof furnished by the *Consultant* are and shall remain the *Consultant*'s property, with the exception of the signed *Contract* sets, which shall belong to each party to the *Contract*. All *Specifications*, *Drawings* and models furnished by the *Consultant* are to be used only with respect to the *Work* and are not to be used on other work. These *Specifications*, *Drawings* and models are not to be copied or altered in any manner without the written authorization of the *Consultant*.

1.1.11 Physical models furnished by the *Contractor* at the *Owner*'s expense are the property of the *Owner*.

GC 1.2 LAW OF THE CONTRACT

1.2.1 The law of the *Place of the Work* shall govern the interpretation of the *Contract*.

GC 1.3 RIGHTS AND REMEDIES

1.3.1 Except as expressly provided in the *Contract Documents*, the duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

1.3.2 No action or failure to act by the *Owner*, the *Consultant* or the *Contractor* shall constitute a waiver of any right or duty afforded any of them under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

GC 1.4 ASSIGNMENT

1.4.1 Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.1 AUTHORITY OF THE CONSULTANT

2.1.1 The *Consultant* will have authority to act on behalf of the *Owner* only to the extent provided in the *Contract Documents*, unless otherwise modified by written agreement as provided in paragraph 2.1.2.

2.1.2 The duties, responsibilities and limitations of authority of the *Consultant* as set forth in the *Contract Documents* shall be modified or extended only with the written consent of the *Owner*, the *Consultant* and the *Contractor*.

GC 2.2 ROLE OF THE CONSULTANT

2.2.1 The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents*.

2.2.2 The *Consultant* will visit the *Place of the Work* at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work and to determine if the *Work* is proceeding in general conformity with the *Contract Documents*.

2.2.3 If the *Owner* and the *Consultant* agree, the *Consultant* will provide at the *Place of the Work*, one or more project representatives to assist in carrying out the *Consultant*'s responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in writing to the *Contractor*.

2.2.4 Based on the *Consultant*'s observations and evaluation of the *Contractor*'s applications for payment, the *Consultant* will determine the amounts owing to the *Contractor* under the *Contract* and will issue certificates for payment as provided in Article A-5 of the Agreement – PAYMENT, GC 5.3 – PAYMENT and GC 5.5 – FINAL PAYMENT.

2.2.5 The *Consultant* will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the *Work* in accordance with the applicable construction safety legislation, other regulations or general construction practice. The *Consultant* will not be responsible for the *Contractor*'s failure to perform the *Work* in accordance with the *Contract Documents*.

2.2.6 Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, the *Consultant* will be, in the first instance, the interpreter of the requirements of the *Contract Documents*.

2.2.7 Matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* shall be initially referred in writing to the *Consultant* by the party raising the question for interpretations and findings and copied to the other party.

2.2.8 Interpretations and findings of the *Consultant* shall be consistent with the intent of the *Contract Documents*. In making such interpretations and findings the *Consultant* will not show partiality to either the *Owner* or the *Contractor*.

2.2.9 The *Consultant*'s interpretations and findings will be given in writing to the parties within a reasonable time.

2.2.10 With respect to claims for a change in *Contract Price*, the *Consultant* will make findings as set out in GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

2.2.11 The *Consultant* will have authority to reject work which in the *Consultant*'s opinion does not conform to the requirements of the *Contract Documents*. Whenever the *Consultant* considers it necessary or advisable, the *Consultant* will have authority to require inspection or testing of work, whether or not such work is fabricated, installed or completed. However, neither the authority of the *Consultant* to act nor any decision either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the *Consultant* to the *Contractor*, *Subcontractors*, *Suppliers,* or their agents, employees, or other persons performing any of the *Work*.

2.2.12 During the progress of the *Work* the *Consultant* will furnish *Supplemental Instructions* to the *Contractor* with reasonable promptness or in accordance with a schedule for such instructions agreed to by the *Consultant* and the *Contractor*.

2.2.13 The *Consultant* will review and take appropriate action upon *Shop Drawings*, samples and other submittals by the *Contractor*, in accordance with the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

2.2.14 The *Consultant* will prepare *Change Orders* and *Change Directives* as provided in GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

2.2.15 The *Consultant* will conduct reviews of the *Work* to determine the date of *Substantial Performance of the Work* and verify that *Ready-for-Takeover* has been attained.

2.2.16 All certificates issued by the *Consultant* will be to the best of the *Consultant*'s knowledge, information and belief. By issuing any certificate, the *Consultant* does not guarantee the *Work* is correct or complete.

2.2.17 The *Consultant* will receive and review written warranties and related documents required by the *Contract* and provided by the *Contractor* and will forward such warranties and documents to the *Owner* for the *Owner*'s acceptance.

2..2.18 If the *Consultant*'s engagement is terminated, the *Owner* shall immediately engage a *Consultant* against whom the *Contractor* makes no reasonable objection and whose duties and responsibilities under the *Contract Documents* will be that of the former *Consultant*.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

2.3.1 The *Owner* and the *Consultant* shall have access to the *Work* at all times. The *Contractor* shall provide sufficient, safe and proper facilities at all times for the review of the *Work* by the *Consultant* and the inspection of the *Work* by authorized agencies. If parts of the *Work* are in preparation at locations other than the *Place of the Work*, the *Owner* and the *Consultant* shall be given access to such work whenever it is in progress.

2.3.2 If work is designated for tests, inspections or approvals in the *Contract Documents*, by the *Consultant*'s instructions, or by the laws or ordinances of the *Place of the Work*, the *Contractor* shall give the *Consultant* reasonable notification of when the work will be ready for review and inspection. The *Contractor* shall arrange for and shall give the *Consultant* reasonable notification of the date and time of inspections by other authorities.

2.3.3 The *Contractor* shall furnish promptly to the *Consultant* two copies of certificates and inspection reports relating to the *Work*.

2.3.4 If the *Contractor* covers, or permits to be covered, work that has been designated for special tests, inspections or approvals before such special tests, inspections or approvals are made, given or completed, the *Contractor* shall, if so directed, uncover such work, have the inspections or tests satisfactorily completed, and make good covering work at the *Contractor*'s expense.

2.3.5 The *Consultant* may order any portion or portions of the *Work* to be examined to confirm that such work is in accordance with the requirements of the *Contract Documents*. If the work is not in accordance with the requirements of the *Contract Documents*, the *Contractor* shall correct the work and pay the cost of examination and correction. If the work is in accordance with the requirements of the *Contract Documents*, the *Owner* shall pay the cost of examination and restoration.

2.3.6 The *Contractor* shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the *Contract Documents* to be performed by the *Contractor* or is required by the laws or ordinances applicable to the *Place of the Work*.

2.3.7 The *Contractor* shall pay the cost of samples required for any test or inspection to be performed by others if such test or inspection is designated in the *Contract Documents*.

GC 2.4 DEFECTIVE WORK

2.4.1 The *Contractor* shall promptly correct defective work that has been rejected by the *Consultant* as failing to conform to the *Contract Documents* whether or not the defective work was incorporated in the *Work* or the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*.

2.4.2 The *Contractor* shall make good promptly *Other Contractors'* work destroyed or damaged by such corrections at the *Contractor*'s expense.

2.4.3 If in the opinion of the *Consultant* it is not expedient to correct defective work or work not performed as provided in the *Contract Documents*, the *Owner* may deduct from the amount otherwise due to the *Contractor* the difference in value between the work as performed and that called for by the *Contract Documents*. If the *Owner* and the *Contractor* do not agree on the difference in value, they shall refer the matter to the *Consultant* for a finding.

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

3.1.1 The *Contractor* shall have total control of the *Work* and shall effectively direct and supervise the *Work* so as to ensure conformity with the *Contract Documents*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

3.1.2 The *Contractor* shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the *Work* under the *Contract*.

GC 3.2 CONSTRUCTION BY THE OWNER OR OTHER CONTRACTORS

3.2.1 The *Owner* reserves the right to award separate contracts in connection with other parts of the *Project* to *Other Contractors* and to perform work with own forces.

3.2.2 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Owner* shall:

.1 provide for the co-ordination of the activities and work of *Other Contractors* and the *Owner*'s own forces with the *Work* of the *Contract*;

.2 enter into separate contracts with *Other Contractors* under conditions of contract which are compatible with the conditions of the *Contract*;

.3 ensure that insurance coverage is provided to the same requirements as are called for in GC 11.1 – INSURANCE and co-ordinate such insurance with the insurance coverage of the *Contractor* as it affects the *Work*; and

.4 take all reasonable precautions to avoid labour disputes or other disputes on the *Project* arising from the work of *Other Contractors* or the *Owner*'s own forces.

3.2.3 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner*'s own forces, the *Contractor* shall:

.1 afford the *Owner* and *Other Contractors* reasonable opportunity to store their products and execute their work;

.2 co-ordinate and schedule the *Work* with the work of *Other Contractors* or the *Owner*'s own forces that are identified in the *Contract Documents*;

.3 participate with *Other Contractors* and the *Owner* in reviewing their construction schedules when directed to do so; and

.4 report promptly to the *Consultant* in writing any apparent deficiencies in the work of *Other Contractors* or of the *Owner*'s own forces, where such work affects the proper execution of any portion of the *Work*, prior to proceeding with that portion of the *Work*.

3.2.4 Where a change in the *Work* is required as a result of the co-ordination and integration of the work of *Other Contractors* or *Owner*'s own forces with the *Work*, the changes shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

3.2.5 Disputes and other matters in question between the *Contractor* and *Other Contractors* shall be dealt with as provided in Part 8 of the General Conditions – DISPUTE RESOLUTION provided the *Other Contractors* have reciprocal obligations. The *Contractor* shall be deemed to have consented to arbitration of any dispute with any *Other Contractor* whose contract with the *Owner* contains a similar agreement to arbitrate. In the absence of *Other Contractors* having reciprocal obligations, disputes and other matters in question initiated by the *Contractor* against *Other Contractors* will be considered disputes and other matters in question between the *Contractor* and the *Owner*.

3.2.6 Should the *Owner*, the *Consultant*, *Other Contractors*, or anyone employed by them directly or indirectly be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 3.3 TEMPORARY WORK

3.3.1 The *Contractor* shall have the sole responsibility for the design, erection, operation, maintenance, and removal of *Temporary Work* unless otherwise specified in the *Contract Documents*.

3.3.2 The *Contractor* shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in paragraph 3.3.1 where required by law or by the *Contract Documents* and in all cases where such *Temporary Work* is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

3.3.3 Notwithstanding the provisions of GC 3.1 – CONTROL OF THE WORK, paragraphs 3.3.1 and 3.3.2 or provisions to the contrary elsewhere in the *Contract Documents* where such *Contract Documents* include designs for *Temporary Work* or specify a method of construction in whole or in part, such designs or methods of construction shall be considered to be part of the design of the *Work* and the *Contractor* shall not be held responsible for that part of the design or the specified method of construction. The *Contractor* shall, however, be responsible for the execution of such design or specified method of construction in the same manner as for the execution of the *Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GC 3.4 CONSTRUCTION SCHEDULE

3.4.1 The *Contractor* shall:

.1 prepare and submit to the *Owner* and the *Consultant* prior to the first application for payment, a construction schedule that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*;

.2 monitor the progress of the *Work* relative to the construction schedule and update the schedule on a monthly basis or as stipulated by the *Contract Documents*; and

.3 advise the *Consultant* of any revisions required to the schedule as the result of extensions of the *Contract Time* as provided in Part 6 of the General Conditions – CHANGES IN THE WORK.

GC 3.5 SUPERVISION

3.5.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while the *Work* is being performed. The appointed representative shall not be changed except for valid reason.

3.5.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor*'s appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

GC 3.6 SUBCONTRACTORS AND SUPPLIERS

3.6.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:

.1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;

.2 incorporate the applicable terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and

.3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and any persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.

3.6.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.

3.6.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.

3.6.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the difference occasioned by such required change.

3.6.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.

3.6.6 The *Owner*, through the *Consultant*, may provide to a *Subcontractor* or *Supplier* information as to the percentage of the *Subcontractor*'s or *Supplier*'s work which has been certified for payment.

GC 3.7 LABOUR AND PRODUCTS

3.7.1 The *Contractor* shall maintain good order and discipline among the *Contractor*'s employees engaged on the *Work* and employ only workers that are skilled in the tasks assigned.

3.7.2 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.

3.7.3 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.

GC 3.8 SHOP DRAWINGS

3.8.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.

3.8.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in accordance with an agreed schedule, or in the absence of an agreed schedule, in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of *Other Contractors* or the *Owner*'s own forces.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

3.8.3 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:

.1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and

.2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.

3.8.4 The *Consultant*'s review is for conformity to the design concept and for general arrangement only.

3.8.5 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.

3.8.6 The *Consultant*'s review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.

3.8.7 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

4.1.1 The *Contract Price* includes the cash allowances, if any, stated in the *Contract Documents*. The scope of the *Work* or costs included in such cash allowances shall be as described in the *Contract Documents*.

4.1.2 The *Contract Price*, and not the cash allowances, includes the *Contractor*'s overhead and profit in connection with such cash allowances.

4.1.3 Expenditures under cash allowances shall be authorized by the *Owner* through the *Consultant*.

4.1.4 Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Consultant's* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.

4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.

4.1.6 The value of the *Work* performed under a cash allowance is eligible to be included in progress payments.

4.1.7 The *Contractor* and the *Consultant* shall jointly prepare a schedule that shows when the items called for under cash allowances must be ordered to avoid delaying the progress of the *Work*.

GC 4.2 CONTINGENCY ALLOWANCE

4.2.1 The *Contract Price* includes the contingency allowance, if any, stated in the *Contract Documents*.

4.2.2 The contingency allowance includes the *Contractor*'s overhead and profit in connection with such contingency allowance.

4.2.3 Expenditures under the contingency allowance shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.2.3 and the contingency allowance.

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

5.1.1 The *Owner* shall, at the request of the *Contractor*, before signing the *Contract*, and promptly from time to time thereafter, furnish to the *Contractor* reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*.

5.1.2 The *Owner* shall give the *Contractor Notice in Writing* of any material change in the *Owner*'s financial arrangements to fulfil the *Owner*'s obligations under the *Contract* during the performance of the *Contract*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

GC 5.2 APPLICATIONS FOR PAYMENT

5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement - PAYMENT shall be submitted monthly to the *Owner* and the *Consultant* simultaneously as the *Work* progresses.

5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties.

5.2.3 The amount claimed shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed and *Products* delivered to the *Place of the Work* as of the last day of the payment period.

5.2.4 The *Contractor* shall submit to the *Consultant*, at least 15 calendar days before the first application for payment, a schedule of values for the parts of the *Work*, aggregating the total amount of the *Contract Price*, so as to facilitate evaluation of applications for payment.

5.2.5 The schedule of values shall be made out in such form as specified in the *Contract* and supported by such evidence as the *Consultant* may reasonably require.

5.2.6 Applications for payment shall be based on the schedule of values accepted by the *Consultant* and shall comply with the provisions of *Payment Legislation*.

5.2.7 Each application for payment shall include evidence of compliance with workers' compensation legislation at the *Place of the Work* and after the first payment, a declaration by the *Contractor* as to the distribution made of the amounts previously received using document CCDC 9A 'Statutory Declaration'.

5.2.8 Applications for payment for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall be supported by such evidence as the *Consultant* may reasonably require to establish the value and delivery of the *Products*.

GC 5.3 PAYMENT

5.3.1 After receipt by the *Consultant* and the *Owner* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 – APPLICATIONS FOR PAYMENT:

.1 The *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 10 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* certifies a different amount, or rejects the application or part thereof, the *Owner* shall promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.

.2 The *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT on or before 28 calendar days after the receipt by the *Owner* and the *Consultant* of the application for payment, and in any event, in compliance with *Payment Legislation*.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

5.4.1 The *Consultant* will review the *Work* to certify or verify the validity of the application for *Substantial Performance of the Work* and will promptly, and in any event, no later than 20 calendar days after receipt of the *Contractor*s application:

.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

.2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.

5.4.2 Where the holdback amount required by the applicable lien legislation has not been placed in a separate lien holdback account, the *Owner* shall, no later than 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.

5.4.3 Subject to the requirements of any *Payment Legislation*, all holdback amount prescribed by the applicable lien legislation for the *Work* shall become due and payable to the *Contractor* no later than 10 *Working Days* following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*.

5.4.4 The *Contractor* shall submit an application for payment of the lien holdback amount in accordance with GC 5.3 – PAYMENT.

5.4.5 Where legislation permits progressive release of the holdback for a portion of the *Work* and the *Consultant* has certified or verified that the part of the *Work* has been performed prior to *Substantial Performance of the Work*, the *Owner* hereby agrees to release, and shall release, such portion to the *Contractor* in accordance with such legislation.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

5.4.6 Notwithstanding any progressive release of the holdback, the *Contractor* shall ensure that such parts of the *Work* are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when the holdback was released.

GC 5.5 FINAL PAYMENT

5.5.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment.

5.5.2 The *Consultant* will, no later than 10 calendar days after the receipt of an application from the *Contractor* for final payment, review the *Work* to verify the validity of the application and when the *Consultant* finds the *Contractor*'s application for final payment valid, the *Consultant* will promptly issue a final certificate for payment to the *Owner*, with a copy to the *Contractor*.

5.5.3 If the *Consultant* rejects the application or part thereof, the *Owner* will promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.

5.5.4 Subject to the provision of paragraph 10.4.1 of GC 10.4 – WORKERS' COMPENSATION, and any legislation applicable to the *Place of the Work*, the *Owner* shall, no later than 5 calendar days after the issuance of a final certificate for payment, pay the *Contractor* as provided in Article A-5 of the Agreement – PAYMENT and in any event, in compliance with *Payment Legislation*.

GC 5.6 DEFERRED WORK

5.6.1 If because of climatic or other conditions reasonably beyond the control of the *Contractor*, or if the *Owner* and the *Contractor* agree that, there are items of work that must be deferred, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such deferred *Work*.

GC 5.7 NON-CONFORMING WORK

5.7.1 No payment by the *Owner* under the *Contract* nor partial or entire use or occupancy of the *Work* by the *Owner* shall constitute an acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents*.

PART 6 CHANGES IN THE WORK

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

6.1.1 The *Owner*, through the *Consultant*, without invalidating the *Contract*, may make:

.1 changes in the *Work* consisting of additions, deletions or other revisions to the *Work* by *Change Order* or *Change Directive*, and

.2 changes to the *Contract Time* for the *Work*, or any part thereof, by *Change Order*.

6.1.2 The *Contractor* shall not perform a change in the *Work* without a *Change Order* or a *Change Directive*.

GC 6.2 CHANGE ORDER

6.2.1 When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall promptly present to the *Consultant*, in a form that can be reasonably evaluated, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*.

6.2.2 When the *Owner* and the *Contractor* agree to the adjustments in the *Contract Price* and *Contract Time* or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a *Change Order*. The value of the work performed as the result of a *Change Order* shall be included in the applications for progress payment.

GC 6.3 CHANGE DIRECTIVE

6.3.1 If the *Owner* requires the *Contractor* to proceed with a change in the *Work* prior to the *Owner* and the *Contractor* agreeing upon the corresponding adjustment in *Contract Price* and *Contract Time*, the *Owner*, through the *Consultant*, shall issue a *Change Directive*.

6.3.2 A *Change Directive* shall only be used to direct a change in the *Work* which is within the general scope of the *Contract Documents*.

6.3.3 A *Change Directive* shall not be used to direct a change in the *Contract Time* only.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

6.3.4 Upon receipt of a *Change Directive*, the *Contractor* shall proceed promptly with the change in the *Work*.

6.3.5 For the purpose of valuing *Change Directives*, changes in the *Work* that are not substitutions or otherwise related to each other shall not be grouped together in the same *Change Directive*.

6.3.6 The adjustment in the *Contract Price* for a change carried out by way of a *Change Directive* shall be determined on the basis of the cost of the *Contractor*'s actual expenditures and savings attributable to the *Change Directive*, valued in accordance with paragraph 6.3.7 and as follows:

.1 If the change results in a net increase in the *Contractor*'s cost, the *Contract Price* shall be increased by the amount of the net increase in the *Contractor*'s cost, plus the *Contractor*'s percentage fee on such net increase.

.2 If the change results in a net decrease in the *Contractor*'s cost, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor*'s cost, without adjustment for the *Contractor*'s percentage fee.

.3 The *Contractor*'s fee shall be as specified in the *Contract Documents* or as otherwise agreed by the parties.

6.3.7 The cost of performing the work attributable to the *Change Directive* shall be limited to the actual cost of the following in as much as it contributes directly to the implementation of the *Change Directive*:

Labour

.1 rates that are listed in the schedule or as agreed by the *Owner* and the *Contractor* including wages, benefits, compensation, contributions, assessments, or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada or Quebec Pension Plan for:

(1) trade labour in the direct employ of the *Contractor*;

(2) the *Contractor*'s personnel when stationed at the field office;

(3) the *Contractor*'s personnel engaged at shops or on the road, in expediting the production or transportation of materials or equipment; and

(4) the *Contractor*'s office personnel engaged in a technical capacity, or other personnel identified in Article A-3 of the Agreement – CONTRACT DOCUMENTS for the time spent in the performance of the *Work*;

Products, Construction Equipment and Temporary Work

.2 cost of all *Products* including cost of transportation thereof;

.3 in the absence of agreed rates, cost less salvage value of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under $1,000 owned by the *Contractor*;

.4 rental cost of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under $1,000;

.5 cost of all equipment and services required for the *Contractor*'s field office;

Subcontract

.6 subcontract amounts of Subcontractor with pricing mechanism approved by the *Owner*;

Others

.7 travel and subsistence expenses of the *Contractor*'s personnel described in paragraph 6.3.7.1;

.8 deposits lost provided that they are not caused by negligent acts or omissions of the *Contractor*;

.9 cost of quality assurance such as independent inspection and testing services;

.10 charges levied by authorities having jurisdiction at the *Place of the Work*;

.11 royalties, patent license fees, and damages for infringement of patents and cost of defending suits therefor subject always to the *Contractor*'s obligations to indemnify the *Owner* as provided in paragraph 10.3.1 of GC 10.3 – PATENT FEES;

.12 premium for all contract securities and insurance for which the *Contractor* is required, by the *Contract Documents*, to provide, maintain and pay in relation to the performance of the *Work*;

.13 losses and expenses sustained by the *Contractor* for matters which are the subject of insurance under the policies prescribed in GC 11.1 – INSURANCE when such losses and expenses are not recoverable because the amounts are in excess of collectible amounts or within the deductible amounts;

.14 taxes and duties, other than *Value Added Taxes*, income, capital, or property taxes, relating to the *Work* for which the *Contractor* is liable;

.15 charges for voice and data communications, courier services, expressage, transmittal and reproduction of documents, and petty cash items;

.16 cost for removal and disposal of waste products and debris;

.17 legal costs, incurred by the *Contractor*, in relation to the performance of the *Work* provided that they are not:

(1) relating to a dispute between the *Owner* and the *Contractor* unless such costs are part of a settlement or awarded by arbitration or court,

(2) the result of the negligent acts or omissions of the *Contractor*, or

(3) the result of a breach of this *Contract* by the *Contractor*;

.18 cost of auditing when requested by the *Owner*; and

.19 cost of *Project* specific information technology in accordance with the method determined by the parties.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

6.3.8 Notwithstanding any other provisions contained in the General Conditions of the *Contract*, it is the intention of the parties that the cost of any item under any cost element referred to in paragraph 6.3.7 shall cover and include any and all costs or liabilities attributable to the *Change Directive* other than those which are the result of or occasioned by any failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s attention to the *Work*. Any cost due to failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor*'s performance of the *Work* attributable to the *Change Directive* shall be borne by the *Contractor*.

6.3.9 The *Contractor* shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the *Work* attributable to the *Change Directive* and shall provide the *Consultant* with copies thereof.

6.3.10 For the purpose of valuing *Change Directives*, the *Owner* shall be afforded reasonable access to all of the *Contractor*'s pertinent documents related to the cost of performing the *Work* attributable to the *Change Directive*.

6.3.11 Pending determination of the final amount of a *Change Directive*, the undisputed value of the *Work* performed as the result of a *Change Directive* is eligible to be included in progress payments.

6.3.12 If the *Owner* and the *Contractor* do not agree on the proposed adjustment in the *Contract Time* attributable to the change in the *Work*, or the method of determining it, the adjustment shall be referred to the *Consultant* for a finding.

6.3.13 When the *Owner* and the *Contractor* reach agreement on the adjustment to the *Contract Price* and to the *Contract Time*, this agreement shall be recorded in a *Change Order*.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 If the *Owner* or the *Contractor* discover conditions at the *Place of the Work* which are:

.1 subsurface or otherwise concealed physical conditions which existed before the commencement of the *Work* and differ materially from those indicated in the *Contract Documents*; or

.2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the *Contract Documents*,

then the observing party shall give *Notice in Writing* to the other party of such conditions before they are disturbed and in no event later than 5 *Working Days* after first observance of the conditions.

6.4.2 The *Consultant* will promptly investigate such conditions and make a finding. If the finding is that the conditions differ materially and this would cause an increase or decrease in the *Contractor*'s cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.

6.4.3 If the *Consultant* finds that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* will promptly inform the *Owner* and the *Contractor* in writing.

6.4.4 If such concealed or unknown conditions relate to toxic and hazardous substances and materials, artifacts and fossils, or mould, the parties will be governed by the provisions of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES, GC 9.3 – ARTIFACTS AND FOSSILS and GC 9.5 – MOULD.

GC 6.5 DELAYS

6.5.1 If the *Contractor* is delayed in the performance of the *Work* by the *Owner*, the *Consultant*, or anyone employed or engaged by them directly or indirectly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.2 If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, resulting in the failure of the *Contractor* to attain *Ready-for-Takeover* by the date stipulated in Article A-1 of the Agreement – THE WORK, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.

6.5.3 If the *Contractor* is delayed in the performance of the *Work* by:

.1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),

.2 fire, unusual delay by common carriers or unavoidable casualties,

.3 abnormally adverse weather conditions, or

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.4 any cause beyond the *Contractor*'s control other than one resulting from a default or breach of *Contract* by the *Contractor*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the *Owner*, the *Consultant* or anyone employed or engaged by them directly or indirectly.

6.5.4 No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary.

6.5.5 If no schedule is made under paragraph 2.2.12 of GC 2.2 – ROLE OF THE CONSULTANT, then no request for extension shall be made because of failure of the *Consultant* to furnish instructions until 10 *Working Days* after demand for such instructions has been made.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall give timely *Notice in Writing* of intent to claim to the other party and to the *Consultant*.

6.6.2 Upon commencement of the event or series of events giving rise to a claim, the party intending to make the claim shall:
.1 take all reasonable measures to mitigate any loss or expense which may be incurred as a result of such event or series of events, and
.2 keep such records as may be necessary to support the claim.

6.6.3 The party making the claim shall submit within a reasonable time to the *Consultant* a detailed account of the amount claimed and the grounds upon which the claim is based and the *Consultant* will make a finding upon such claim.

6.6.4 Where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, at such intervals as the *Consultant* may reasonably require, submit further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

6.6.5 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.

6.6.6 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION.

PART 7 DEFAULT NOTICE

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

7.1.1 If the *Contractor* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Contractor*'s insolvency, or if a receiver is appointed because of the *Contractor*'s insolvency, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, terminate the *Contractor*'s right to continue with the *Work*, by giving the *Contractor* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.1.2 If the *Contractor* neglects to perform the *Work* properly or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and if the *Consultant* has given a written statement to the *Owner* and *Contractor* which provides the detail of such neglect to perform the *Work* properly or such failure to comply with the requirements of the *Contract* to a substantial degree, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor Notice in Writing*, containing particulars of the default including references to applicable provisions of the *Contract*, that the *Contractor* is in default of the *Contractor*'s contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.

7.1.3 If the default cannot be corrected in the 5 *Working Days* specified or in such other time period as may be subsequently agreed in writing by the parties, the *Contractor* shall be in compliance with the *Owner*'s instructions if the *Contractor*:
.1 commences the correction of the default within the specified time,
.2 provides the *Owner* with an acceptable schedule for such correction, and
.3 corrects the default in accordance with the *Contract* terms and with such schedule.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

7.1.4 If the *Contractor* fails to correct the default in the time specified or in such other time period as may be subsequently agreed in writing by the parties, without prejudice to any other right or remedy the *Owner* may have, the *Owner* may by giving *Notice in Writing*:

.1 correct such default and deduct the cost thereof from any payment then or thereafter due the *Contractor* for the *Work* provided the *Consultant* has certified such cost to the *Owner* and the *Contractor*, or

.2 terminate the *Contractor*'s right to continue with the *Work* in whole or in part or terminate the *Contract*.

7.1.5 If the *Owner* terminates the *Contractor*'s right to continue with the *Work* as provided in paragraphs 7.1.1 and 7.1.4, the *Owner* shall be entitled to:

.1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* at the *Place of the Work*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense,

.2 withhold further payment to the *Contractor* until a final certificate for payment is issued,

.3 charge the *Contractor* the amount by which the full cost of finishing the *Work* as certified by the *Consultant*, including compensation to the *Consultant* for the *Consultant*'s additional services and a reasonable allowance as determined by the *Consultant* to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 – WARRANTY, exceeds the unpaid balance of the *Contract Price*; however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference, and

.4 on expiry of the warranty period, charge the *Contractor* the amount by which the cost of corrections to the *Contractor*'s work under GC 12.3 – WARRANTY exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the *Contractor* the difference.

7.1.6 The *Contractor*'s obligation under the *Contract* as to quality, correction and warranty of the work performed by the *Contractor* up to the time of termination shall continue in force after such termination of the *Contract*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

7.2.1 If the *Owner* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Owner*'s insolvency, or if a receiver is appointed because of the *Owner*'s insolvency, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.2.2 If the *Work* is suspended or otherwise delayed for a period of 20 *Working Days* or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or of anyone directly or indirectly employed or engaged by the *Contractor*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner Notice in Writing* to that effect.

7.2.3 The *Contractor* may give *Notice in Writing* to the *Owner*, with a copy to the *Consultant*, that the *Owner* is in default of the *Owner*'s contractual obligations if:

.1 the *Owner* fails to furnish, when so requested by the *Contractor*, reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*,

.2 the *Consultant* fails to issue a certificate as provided in Part 5 of the General Conditions – PAYMENT,

.3 the *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by adjudication, arbitration or court, or

.4 the *Owner* fails to comply with the requirements of the *Contract* to a substantial degree and the *Consultant*, except for GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, gives a written statement to the *Owner* and the *Contractor* that provides detail of such failure to comply with the requirements of the *Contract* to a substantial degree.

7.2.4 The *Contractor*'s *Notice in Writing* to the *Owner* provided under paragraph 7.2.3 shall advise that if the default is not corrected within 5 *Working Days* following the receipt of the *Notice in Writing*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, suspend the *Work* or terminate the *Contract*.

7.2.5 If the *Contractor* terminates the *Contract* by giving a *Notice in Writing* to the *Owner* under the conditions set out above, the *Contractor* shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*.

PART 8 DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of the *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

in the first instance by findings of the *Consultant* as provided in GC 2.2 – ROLE OF THE CONSULTANT, shall be settled in accordance with the requirements of Part 8 of the General Conditions – DISPUTE RESOLUTION.

8.1.2 If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, the procedures set out in paragraph 8.1.3 and paragraphs 8.3.3 to 8.3.8 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.4 – RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.

8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instructions as in the *Consultant*'s opinion are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim the party may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required, including costs resulting from interruption of the *Work*.

GC 8.2 ADJUDICATION

8.2.1 Nothing in this *Contract* shall be deemed to affect the rights of the parties to resolve any dispute by adjudication as may be prescribed by applicable legislation.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

8.3.1 In accordance with the rules for mediation as provided in CCDC 40 'Rules for Mediation and Arbitration of Construction Industry Disputes' in effect at the time of bid closing, the parties shall appoint a Project Mediator

.1 within 20 *Working Days* after the *Contract* was awarded, or

.2 if the parties neglected to make an appointment within the 20 *Working Days*, within 10 *Working Days* after either party by *Notice in Writing* requests that the Project Mediator be appointed.

8.3.2 A party shall be conclusively deemed to have accepted a finding of the *Consultant* under GC 2.2 – ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*. The responding party shall send a *Notice in Writing* of reply to the dispute within 10 *Working Days* after receipt of such *Notice in Writing* setting out particulars of this response and any relevant provisions of the *Contract Documents*.

8.3.3 The parties shall make all reasonable efforts to resolve their dispute by amicable negotiations and agree to provide, without prejudice, frank, candid, and timely disclosure of relevant facts, information and documents to facilitate these negotiations.

8.3.4 After a period of 10 *Working Days* following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.3.2, the parties shall request the Project Mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the rules for mediation as provided in CCDC 40 in effect at the time of bid closing.

8.3.5 If the dispute has not been resolved at the mediation or within such further period as is agreed by the parties, the Project Mediator will terminate the mediated negotiations by giving *Notice in Writing* to the *Owner*, the *Contractor* and the *Consultant*.

8.3.6 By giving a *Notice in Writing* to the other party and the *Consultant*, not later than 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.3.5, either party may refer the dispute to be finally resolved by arbitration under the rules of arbitration as provided in CCDC 40 in effect at the time of bid closing. The arbitration shall be conducted in the jurisdiction of the *Place of the Work*.

8.3.7 On expiration of the 10 *Working Days*, the arbitration agreement under paragraph 8.3.6 is not binding on the parties and, if a *Notice in Writing* is not given under paragraph 8.3.6 within the required time, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.

8.3.8 If neither party, by *Notice in Writing*, given within 10 *Working Days* of the date of *Notice in Writing* requesting arbitration in paragraph 8.3.6, requires that a dispute be arbitrated immediately, all disputes referred to arbitration as provided in paragraph 8.3.6 shall be:

.1 held in abeyance until:

(1) *Ready-for-Takeover*,

(2) the *Contract* has been terminated, or

(3) the *Contractor* has abandoned the *Work*,

whichever is earlier; and

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.2 consolidated into a single arbitration under the rules governing the arbitration under paragraph 8.3.6.

GC 8.4 RETENTION OF RIGHTS

8.4.1 It is agreed that no act by either party shall be construed as a renunciation or waiver of any rights or recourses, provided the party has given the *Notice in Writing* required under Part 8 of the General Conditions – DISPUTE RESOLUTION and has carried out the instructions as provided in paragraph 8.1.3 of GC 8.1 – AUTHORITY OF THE CONSULTANT.

8.4.2 Nothing in Part 8 of the General Conditions – DISPUTE RESOLUTION shall be construed in any way to limit a party from asserting any statutory right to a lien under applicable lien legislation of the jurisdiction of the *Place of the Work* and the assertion of such right by initiating judicial proceedings is not to be construed as a waiver of any right that party may have under paragraph 8.3.6 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION to proceed by way of arbitration to adjudicate the merits of the claim upon which such a lien is based.

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

9.1.1 The *Contractor* shall protect the *Work*, the *Owner*'s property and property adjacent to the *Place of the Work* from damage which may arise as the result of the *Contractor*'s operations under the *Contract*, and shall be responsible for such damage, except damage which occurs as the result of:
.1 errors or omissions in the *Contract Documents*; or
.2 acts or omissions by the *Owner*, the *Consultant*, *Other Contractors*, or their agents and employees.

9.1.2 Before commencing any work, the *Contractor* shall determine the location of all underground utilities and structures indicated in the *Contract Documents* or that are reasonably apparent in an inspection of the *Place of the Work*.

9.1.3 Should the *Contractor* in the performance of the *Contract* damage the *Work*, the *Owner*'s property or property adjacent to the *Place of the Work*, the *Contractor* shall be responsible for making good such damage at the *Contractor*'s expense.

9.1.4 Should damage occur to the *Work* or the *Owner*'s property for which the *Contractor* is not responsible, as provided in paragraph 9.1.1, the *Contractor* shall make good such damage to the *Work* and, if the *Owner* so directs, to the *Owner*'s property. The *Contract Price* and *Contract Time* shall be adjusted as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

9.2.1 For the purposes of applicable legislation related to toxic and hazardous substances, the *Owner* shall be deemed to have control and management of the *Place of the Work* with respect to existing conditions.

9.2.2 Prior to the *Contractor* commencing the *Work*, the *Owner* shall,
.1 take all reasonable steps to determine whether any toxic or hazardous substances are present at the *Place of the Work*, and
.2 provide the *Consultant* and the *Contractor* with a written list of any such substances that are known to exist and their locations.

9.2.3 The *Owner* shall take all reasonable steps to ensure that no person's exposure to any toxic or hazardous substance exceeds the time weighted levels prescribed by applicable legislation at the *Place of the Work* and that no property is damaged or destroyed as a result of exposure to, or the presence of, toxic or hazardous substances which were at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.4 Unless the *Contract* expressly provides otherwise, the *Owner* shall be responsible for taking all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to dispose of, store or otherwise render harmless any toxic or hazardous substance which was present at the *Place of the Work* prior to the *Contractor* commencing the *Work*.

9.2.5 If the *Contractor*
.1 encounters toxic or hazardous substances at the *Place of the Work*, or
.2 has reasonable grounds to believe that toxic or hazardous substances are present at the *Place of the Work*,
which were not brought to the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible and which were not disclosed by the *Owner* or which were disclosed but have not been dealt with as required under paragraph 9.2.4, the *Contractor* shall
.3 take all reasonable steps, including stopping the *Work*, to ensure that no person's exposure to any toxic or hazardous substance exceeds any applicable time weighted levels prescribed by applicable legislation at the *Place of the Work*, and
.4 immediately report the circumstances to the *Consultant* and the *Owner* in writing.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

9.2.6 If the *Owner* and the *Contractor* do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

9.2.7 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were not brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall promptly at the *Owner's* own expense:

.1 take all steps as required under paragraph 9.2.4;

.2 reimburse the *Contractor* for the costs of all steps taken pursuant to paragraph 9.2.5;

.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in 9.2.6 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay; and

.4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.

9.2.8 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Contractor* shall promptly at the *Contractor's* own expense:

.1 take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose the toxic or hazardous substances;

.2 make good any damage to the *Work*, the *Owner*'s property or property adjacent to the place of the *Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY;

.3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.2.6; and

.4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.

9.2.9 If either party does not accept the expert's findings under paragraph 9.2.6, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraph 9.2.7 or 9.2.8 it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided by GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

GC 9.3 ARTIFACTS AND FOSSILS

9.3.1 Fossils, coins, articles of value or antiquity, structures and other remains or things of scientific or historic interest discovered at the *Place or Work* shall, as between the *Owner* and the *Contractor*, be deemed to be the absolute property of the *Owner*.

9.3.2 The *Contractor* shall take all reasonable precautions to prevent removal or damage to discoveries as identified in paragraph 9.3.1, and shall advise the *Consultant* upon discovery of such items.

9.3.3 The *Consultant* will investigate the impact on the *Work* of the discoveries identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.

GC 9.4 CONSTRUCTION SAFETY

9.4.1 The *Contractor* shall be responsible for establishing, initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the *Work* in accordance with the applicable health and safety legislation.

9.4.2 The *Owner* and the *Contractor* shall comply with all health and safety precautions and programs established at the *Place of the Work*.

9.4.3 The *Owner* and the *Contractor* shall comply with the rules, regulations and practices required by the applicable health and safety legislation.

9.4.4 The *Owner* shall cause the *Consultant*, *Other Contractors* and the *Owner*'s own forces to comply with all health and safety precautions and programs established by the *Contractor* at the *Place of the Work*.

9.4.5 Nothing in this *Contract* shall affect the determination of liability under the applicable health and safety legislation.

GC 9.5 MOULD

9.5.1 If the *Contractor* or the *Owner* observes or reasonably suspects the presence of mould at the *Place of the Work*, the remediation of which is not expressly part of the *Work*,

.1 the observing party shall promptly report the circumstances to the other party in writing,

.2 the *Contractor* shall promptly take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould, and

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

10.2.6 If the *Contractor* fails to advise the *Consultant* in writing; fails to obtain direction as required in paragraph 10.2.5; and performs work knowing it to be contrary to any laws, ordinances, rules, regulations, or codes; the *Contractor* shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations, or codes.

10.2.7 If, subsequent to the time of bid closing, changes are made to applicable laws, ordinances, rules, regulations, or codes of authorities having jurisdiction which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

GC 10.3 PATENT FEES

10.3.1 The *Contractor* shall pay the royalties and patent licence fees required for the performance of the *Contract*. The *Contractor* shall hold the *Owner* harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention by the *Contractor* or anyone for whose acts the *Contractor* may be liable.

10.3.2 The *Owner* shall hold the *Contractor* harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the *Contract*, the physical model, plan or design of which was supplied to the *Contractor* as part of the *Contract*.

GC 10.4 WORKERS' COMPENSATION

10.4.1 Prior to commencing the *Work*, and again with the *Contractor*'s applications for payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation at the *Place of the Work*.

PART 11 INSURANCE

GC 11.1 INSURANCE

11.1.1 Without restricting the generality of GC 13.1 – INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the requirements of which are specified in CCDC 41 'CCDC Insurance Requirements' in effect at the time of bid closing except as hereinafter provided:

.1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover* on an ongoing basis for a period of 6 years following *Ready-for-Takeover*.

.2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.3 Unmanned aerial vehicle aircraft, manned aircraft or watercraft Liability Insurance when owned or non-owned manned or unmanned aircraft or watercraft are used directly or indirectly in the performance of the *Work*.

.4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

(1) 10 calendar days after the date of *Ready-for-Takeover*;

(2) on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*; and

(3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.

.5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Ready-for-Takeover*.

.6 The "Broad form" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:

(1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.3 if the *Owner* and the *Contractor* do not agree on the existence, significance or cause of the mould or as to what steps need be taken to deal with it, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.

9.5.2 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was caused by the *Contractor*'s operations under the *Contract*, the *Contractor* shall promptly, at the *Contractor*'s own expense:

.1 take all reasonable and necessary steps to safely remediate or dispose of the mould,

.2 make good any damage to the *Work*, the *Owner*'s property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,

.3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.5.1.3, and

.4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.

9.5.3 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was not caused by the *Contractor*'s operations under the *Contract*, the *Owner* shall promptly, at the *Owner*'s own expense:

.1 take all reasonable and necessary steps to safely remediate or dispose of the mould,

.2 reimburse the *Contractor* for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the *Work* as provided in paragraph 9.1.4 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,

.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in paragraph 9.5.1.3 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay, and

.4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.

9.5.4 If either party does not accept the expert's finding under paragraph 9.5.1.3, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraphs 9.5.2 or 9.5.3, it being understood that by so doing neither party will jeopardize any claim the party may have to be reimbursed as provided by GC 9.5 – MOULD.

PART 10 GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

10.1.1 The *Contract Price* shall include all taxes and customs duties in effect at the time of the bid closing except for *Value Added Taxes* payable by the *Owner* to the *Contractor* as stipulated in Article A-4 of the Agreement – CONTRACT PRICE.

10.1.2 Any increase or decrease in costs to the *Contractor* due to changes in taxes and duties after the time of the bid closing shall increase or decrease the *Contract Price* accordingly.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

10.2.1 The laws of the *Place of the Work* shall govern the *Work*.

10.2.2 The *Owner* shall obtain and pay for development approvals, building permit, permanent easements, rights of servitude, and all other necessary approvals and permits, except for the permits and fees referred to in paragraph 10.2.3 or for which the *Contract Documents* specify as the responsibility of the *Contractor*.

10.2.3 The *Contractor* shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the *Work* and customarily obtained by contractors in the jurisdiction of the *Place of the Work* after the issuance of the building permit. The *Contract Price* includes the cost of these permits, licences, inspections, and certificates, and their procurement.

10.2.4 The *Contractor* shall give the required notices and comply with the laws, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.

10.2.5 The *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the *Work*. If the *Contract Documents* are at variance therewith, or if, subsequent to the time of bid closing, changes are made to the applicable laws, ordinances, rules, regulations, or codes which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will issue the changes required to the *Contract Documents* as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner*'s interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor*'s interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner*'s own forces or *Other Contractors*, the *Owner* shall, in accordance with the *Owner*'s obligations under the provisions relating to construction by the *Owner* or *Other Contractors*, pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.8 Contractors' Pollution Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

11.1.3 The parties shall pay their share of the deductible amounts in direct proportion to their responsibility in regards to any loss for which the above policies are required to pay, except where such amounts may be excluded by the terms of the *Contract*.

11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right to provide and maintain such insurance and give evidence to the *Contractor* and the *Consultant*. The *Contractor* shall pay the cost thereof to the *Owner* on demand or the *Owner* may deduct the cost from the amount which is due or may become due to the *Contractor*.

11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.

11.1.6 If a revised version of CCDC 41 is published, which specifies reduced insurance requirements, the parties shall address such reduction, prior to the *Contractor*'s insurance policy becoming due for renewal, and record any agreement in a *Change Order*.

11.1.7 If a revised version of CCDC 41 is published, which specifies increased insurance requirements, the *Owner* may request the increased coverage from the *Contractor* by way of a *Change Order*.

11.1.8 A *Change Directive* shall not be used to direct a change in the insurance requirements in response to the revision of CCDC 41.

PART 12 OWNER TAKEOVER

GC 12.1 READY-FOR-TAKEOVER

12.1.1 The prerequisites to attaining *Ready-for-Takeover* of the *Work* are limited to the following:

.1 The *Consultant* has certified or verified the *Substantial Performance of the Work*.

.2 Evidence of compliance with the requirements for occupancy or occupancy permit as prescribed by the authorities having jurisdiction.

.3 Final cleaning and waste removal at the time of applying for *Ready-for-Takeover*, as required by the *Contract Documents*.

.4 The delivery to the *Owner* of such operations and maintenance documents reasonably necessary for immediate operation and maintenance, as required by the *Contract Documents*.

.5 Make available a copy of the as-built drawings completed to date on site.

.6 Startup, testing required for immediate occupancy, as required by the *Contract Documents*.

.7 Ability to secure access to the *Work* has been provided to the *Owner*, if required by the *Contract Documents*.

.8 Demonstration and training, as required by the *Contract Documents*, is scheduled by the *Contractor* acting reasonably.

12.1.2 If any prerequisites set forth in paragraphs 12.1.1.3 to 12.1.1.6 must be deferred because of conditions reasonably beyond the control of the *Contractor*, or by agreement between the *Owner* and the *Contractor* to do so, *Ready-for-Takeover* shall not be delayed.

12.1.3 When the *Contractor* considers that the *Work* is *Ready-for-Takeover*, the *Contractor* shall deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for *Ready-for-Takeover* for review. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

12.1.4 The *Consultant* will review the *Work* to verify the validity of the application and will promptly, and in any event, no later than 10 calendar days after receipt of the *Contractor*'s list and application:

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.1 advise the *Contractor* in writing that the *Work* is not *Ready-for-Takeover* and give reasons why, or
.2 confirm the date of *Ready-for-Takeover* in writing to each of the *Owner* and the *Contractor*.

12.1.5 Immediately following the confirmation of the date of *Ready-for-Takeover*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for finishing the *Work*.

12.1.6 The provision of GC 12.1 – READY-FOR-TAKEOVER shall be subject to GC 12.2 – EARLY OCCUPANCY BY THE OWNER.

GC 12.2 EARLY OCCUPANCY BY THE OWNER

12.2.1 The *Owner* may take occupancy of a part or the entirety of the *Work* before *Ready-for-Takeover* has been attained only as agreed by the *Contractor* which agreement shall not be unreasonably withheld.

12.2.2 The *Owner* shall not occupy a part or the entirety of the *Work* without prior approval by authorities having jurisdiction.

12.2.3 If the *Owner* takes occupancy of a part of the *Work* before *Ready-for-Takeover* has been attained:
.1 The part of the *Work* which is occupied shall be deemed to have been taken over by the *Owner* as from the date on which it is occupied.
.2 The *Contractor* shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the *Owner*.
.3 The warranty period specified in paragraph 12.3.1 of GC 12.3 – WARRANTY for that part of the *Work* shall start from the date on which it is occupied.

12.2.4 If the *Owner* takes occupancy of the entirety of the *Work* before all the prerequisites are met as described in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER, the *Work* shall, subject to the requirements of the applicable lien legislation, be deemed to achieve *Ready-for-Takeover*. This shall not relieve the *Contractor*'s responsibility to complete the *Work* in a timely manner.

GC 12.3 WARRANTY

12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date when *Ready-for-Takeover* has been attained.

12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.

12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor*'s expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.

12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.

12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor*'s responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

PART 13 INDEMNIFICATION AND WAIVER

GC 13.1 INDEMNIFICATION

13.1.1 Without restricting the parties' obligation to indemnify respecting toxic and hazardous substances, patent fees and defect in title claims all as described in paragraphs 13.1.4 and 13.1.5, the *Owner* and the *Contractor* shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this *Contract*, provided such claims are:
.1 caused by:
(1) the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose negligent acts or omissions that party is liable, or
(2) a failure of the party to the *Contract* from whom indemnification is sought to fulfill its terms or conditions; and
.2 made by *Notice in Writing* within a period of 6 years from the *Ready-for-Takeover* date or within such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.

The parties expressly waive the right to indemnity for claims other than those provided for in this *Contract*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

13.1.2 The obligation of either party to indemnify as set forth in paragraph 13.1.1 shall be limited as follows:

.1 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is to be provided by either party pursuant to GC 11.1 – INSURANCE, the minimum liability insurance limit for one occurrence, of the applicable insurance policy, as referred to in CCDC 41 in effect at the time of bid closing.

.2 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is not required to be provided by either party in accordance with GC 11.1 – INSURANCE, the greater of the *Contract Price* as recorded in Article A-4 – CONTRACT PRICE or $2,000,000, but in no event shall the sum be greater than $20,000,000.

.3 In respect to indemnification by a party against the other with respect to losses suffered by them, such obligation shall be restricted to direct loss and damage, and neither party shall have any liability to the other for indirect, consequential, punitive or exemplary damages.

.4 In respect to indemnification respecting claims by third parties, the obligation to indemnify is without limit.

13.1.3 The obligation of either party to indemnify the other as set forth in paragraphs 13.1.1 and 13.1.2 shall be inclusive of interest and all legal costs.

13.1.4 The *Owner* and the *Contractor* shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

13.1.5 The *Owner* shall indemnify and hold harmless the *Contractor* from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings:

.1 as described in paragraph 10.3.2 of GC 10.3 – PATENT FEES, and

.2 arising out of the *Contractor*'s performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.

13.1.6 In respect to any claim for indemnity or to be held harmless by the *Owner* or the *Contractor*:

.1 *Notice in Writing* of such claim shall be given within a reasonable time after the facts upon which such claim is based become known; and

.2 should any party be required as a result of its obligation to indemnify another to pay or satisfy a final order, judgment or award made against the party entitled by this contract to be indemnified, then the indemnifying party upon assuming all liability for any costs that might result shall have the right to appeal in the name of the party against whom such final order or judgment has been made until such rights of appeal have been exhausted.

GC 13.2 WAIVER OF CLAIMS

13.2.1 Subject to any lien legislation applicable to the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:

.1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than 5 calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work* or 20 calendar days following the *Ready-for-Takeover* date, whichever is later;

.2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;

.3 claims respecting toxic and hazardous substances, patent fees and defect in title matters for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 13.1.4 or 13.1.5 of GC 13.1 – INDEMNIFICATION; and

.4 claims resulting from acts or omissions which occur after the *Ready-for-Takeover* date.

13.2.2 The *Contractor* waives and releases the *Owner* from all claims resulting from acts or omissions which occurred after the *Ready-for-Takeover* date except for:

.1 indemnification respecting third party claims, and claims respecting toxic and hazardous substances, patent fees and defect in title matters, all as referred in paragraphs 13.2.1.2 and 13.2.1.3; and

.2 claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the *Ready-for-Takeover* date.

13.2.3 Subject to any lien legislation applicable to the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:

.1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than 20 calendar days following the *Ready-for-Takeover* date;

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 - 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

.2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;
.3 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 13.1.4 of GC 13.1 – INDEMNIFICATION;
.4 damages arising from the *Contractor*'s actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;
.5 claims arising pursuant to GC 12.3 – WARRANTY; and
.6 claims arising from acts or omissions which occur after the *Ready-for-Takeover* date.

13.2.4 Respecting claims arising upon substantial defects and deficiencies in the *Work*, as referenced in paragraph 13.2.3.4, and notwithstanding paragraph 13.2.3.5, the *Owner* waives and releases the *Contractor* from all claims except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the *Ready-for-Takeover* date, provided that any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, the time within which any such claim may be brought shall be such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.

13.2.5 The *Owner* waives and releases the *Contractor* from all claims arising from acts or omissions which occur after the *Ready-for-Takeover* date, except for:
.1 indemnification for claims advanced against the *Owner* by third parties, as referenced in paragraph 13.2.3.2;
.2 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor*, as referenced in paragraph 13.2.3.3;
.3 claims arising under GC 12.3 – WARRANTY; and
.4 claims for which *Notice is Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the *Ready-for-Takeover* date.

13.2.6 "*Notice in Writing* of claim" as provided for in GC 13.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 13.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:
.1 a clear and unequivocal statement of an intention to claim;
.2 a statement as to the nature of the claim and the grounds upon which the claim is based; and
.3 a statement of the estimated quantum of the claim.

13.2.7 A claim for lien asserted under the lien legislation prevailing at the *Place of the Work* shall qualify as notice of claim for the purposes of this *Contract*.

13.2.8 The party giving the *Notice in Writing* of claim as provided for in GC 13.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.

13.2.9 Where the event or series of events giving rise to a claim made under paragraphs 13.2.1 or 13.2.3 has a continuing effect, the detailed account submitted under paragraph 13.2.8 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which such claim is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

13.2.10 Nothing in GC 13.2 – WAIVER OF CLAIMS shall be deemed to affect the rights of the parties under any lien legislation or limitations legislation prevailing at the *Place of the Work*.

Note: This contract is protected by copyright. Use of a CCDC 2 document not containing a CCDC 2 copyright seal constitutes an infringement of copyright. Only sign this contract if the document cover page bears a CCDC 2 copyright seal to demonstrate that it is intended by the parties to be an accurate and unamended version of CCDC 2 – 2020 except to the extent that any alterations, additions or modifications are set forth in supplementary conditions.

AVIVA

GLOBAL
CORPORATE
SPECIALTY

AGREEMENT TO PERFORMANCE AND LABOUR & MATERIAL PAYMENT BOND

BOND NO.: **838896-003-22**

NAME OF OBLIGEE: **THE CORPORATION OF THE CITY OF SAULT STE. MARIE, 4TH FLOOR, CIVIC CENTRE, 99 FOSTER DRIVE, SAULT STE. MARIE, ON P6A 5X6**

DESCRIPTION OF PROJECT: **PROJECT NO. 2022CDE-PE-02-T, SAULT STE. MARIE DOWNTOWN CIVIC PLAZA**

Notwithstanding any conditions set out in the specifications or contract to the contrary, it is further understood and agreed that if this bid is successful and the contract awarded, the performance bond will cover a ONE (1) years maintenance on materials and workmanship from the date of Substantial Performance of the contract.

We, the undersigned, hereby agree to become bound as surety for **AVERY CONSTRUCTION LIMITED** in a **Performance Bond** in the sum of **100%** of the contract amount, and a **Labour and Material Payment Bond** in the sum of **50%** of the contract amount, and conforming to the Instruments of Contract for the full and due performance of the works shown and described therein, if the tender attached hereto is accepted by the owner, and the bond is requested within **THIRTY (30)** days from the date of acceptance of the tender.

This Agreement to Bond shall be null and void unless an application for the said bond(s) is made within 30 days following the award of the contract.

Signed, sealed and dated this **6TH day of APRIL in the year 2022.**

Aviva Insurance Company of Canada

Larry Day,

Attorney-in-Fact

SURETY CANADA

AVIVA

GLOBAL CORPORATE SPECIALTY

BID BOND

BOND NO.: **838896-003-22**

Bond Amount **10% OF TENDER**

AVERY CONSTRUCTION LIMITED as Principal, hereinafter called the Principal, and **AVIVA INSURANCE COMPANY OF CANADA** a corporation created and existing under the laws of Canada and duly authorized to transact the business of Suretyship in all Provinces and Territories in Canada as Surety, hereinafter called the Surety, are held and firmly bound unto **THE CORPORATION OF THE CITY OF SAULT STE. MARIE, 4TH FLOOR, CIVIC CENTRE, 99 FOSTER DRIVE, SAULT STE. MARIE, ON P6A 5X6** as Obligee, hereinafter called the Obligee, in the amount of **TEN PERCENT OF TENDER** dollars **(10% OF TENDER)** lawful money of Canada, for the payment of which sum the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

WHEREAS, the Principal has submitted a written bid to the Obligee, dated **7TH** day of **APRIL,** in the year **2022** for **PROJECT NO. 2022CDE-PE-02-T, SAULT STE. MARIE DOWNTOWN CIVIC PLAZA.** The condition of this obligation is such that if the Principal shall have the bid accepted within the time period prescribed in the Obligee's bid documents, or, if no time period is specified in the Obligee's bid documents, within **THIRTY (30)** days from the closing date as specified in the Obligee's bid documents, and the Principal enters into a formal contract and gives the specified security, then this obligation shall be void; otherwise, provided the Obligee takes all reasonable steps to mitigate the amount of such excess costs, the Principal and the Surety will pay to the Obligee the difference in money between the amount of the bid of the Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former.

The Principal and Surety shall not be liable for a greater sum than the Bond Amount.

It is a condition of this bond that any suit or action must be commenced within twelve (12) months of the date of this Bond.

No right of action shall accrue hereunder to or for the use of any person or corporation other than the Obligee named herein, or the heirs, executors, administrators or successors of the Obligee.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond dated **6TH** day of **APRIL** in the year **2022.**

SIGNED and SEALED

AVERY CONSTRUCTION LIMITED

in the presence of

JEFFREY AVERY

AVIVA INSURANCE COMPANY OF CANADA

A2786

Larry Day, Attorney-in-fact

SURETY ASSOCIATION OF CANADA

940 Second Line West
Sault Ste. Marie, Ontario, P6C 2L3
Phone: 705-759-4800 *Toll Free:* 800-461-0525
Facsimile: 705-759-6775
Email: info@averyconstruction.ca

Construction Limited & Transportation Services

www.averyconstruction.ca

City of Sault Ste Marie
99 Foster Drive,
Sault Ste Marie, ON P6A 5X6

RE: Downtown Civic Plaza Tender Opportunity **Thursday, April 7, 2022**

We are pleased to provide the tender proposal for the proposed Downtown Civic Plaza project and have included our pricing in the appropriate format based on the tender specifications. In addition, we have included a milestone schedule that outlines key milestones which we are proposing for the project. Please note that we are basing this proposal on reasonable procurement times for materials and any long lead delays that may occur would push these milestones accordingly. Currently, the open web steel joists are forecasted to have a 10-12 month lead time, and, if successful on this tender, we plan to present an alternative for the open web steel joists which have a lead time indicative of what we have presented on our milestone schedule. In the event that the alternative to the open web steel joists is not acceptable to the client, this would result in a final completion date of December 11, 2023, as our structural steel component would not commence until April 2023. We have not been made aware of any other potential long lead time items but suppliers in this current market are qualifying that there is a potential that we could experience material shortages and delays.

Also, as we are all aware of the current challenges with fuel costs and the volatility of that market. We are basing this pricing on current market conditions and in the event that there is a drastic increase in fuel prices, we would submit a change proposal to be compensated for those unforeseen expenses.

Thank you for the opportunity to quote this project.

Sincerely,

Avery Construction

Stipulated Price Bid Form

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): AVERY CONSTRUCTION LTD.
company name

940 SECOND LINE, WEST
street address or postal box number

SAULT STE MARIE, ONTARIO P6C 2L3
city/town, province and postal code

To (*Owner*): The Corporation of the City of Sault Ste. Marie
4th Floor, Civic Centre, 99 Foster Drive
Sault Ste. Marie, Ontario P6A 5X6

1.1 Bid Price

.1 We, the undersigned, having examined the *Bid Documents* and addenda numbered 1 - 4 (inclusive), and having examined the *Place of the Work*, and examined conditions thereon that affect the *Work*; hereby accept and agree to enter into a *Contract* with the *Owner* to perform the *Work* required by the *Contract Documents* for the stipulated bid price of:

$ 8,791,899.71 in Canadian dollars, excluding *Value Added Taxes*.
amount in figures

1.2 Declarations

.1 We understand that the *Owner* will pay the *Value Added Taxes* payable with respect to the *Contract Price* and such is not included in the bid price.

.2 We accept and agree to submit to the *Owner* required bonds and proofs of insurance specified in the conditions of the *Contract*, and as described in the *Bid Documents*, and to execute the *Contract* within 2 weeks from the date of notification of acceptance of this bid. We understand and agree that the submittal, by us, to the *Owner* of the required bonds and proofs of insurance, within 7 days after receipt of notification of conditional award, will be a condition of the final award of the *Contract* to us by the *Owner*, to the extent permitted by any other conditions contained in the notice of conditional acceptance.

.3 We undertake if our bid is accepted to commence the *Work* at the *Place of the Work*, actively, within 10 *Working Days* of the *Owner's* written authorization to commence the *Work*.

.4 We declare that no person, firm or corporation other than the undersigned has any interest in this bid or in the proposed *Contract* for which this bid is made.

.5 We propose to attain *Substantial Performance of the Work* as certified by the *Consultant* within 34 weeks from notification of conditional award of the *Contract* to the bidder by the *Owner*.

.6 We propose to attain Total Performance of the *Work* as certified by the *Consultant* within 37 weeks from notification of conditional award of the *Contract* to the bidder by the *Owner*.

.7 We accept and agree that this bid is irrevocable and may not be withdrawn by the undersigned, subject to the conditions of the *Bid Documents* pertaining to the withdrawal of bids, and is open for acceptance by the *Owner* during the *Bid Acceptance Period*.

.8 We have thoroughly examined the complete *Bid Documents*, and have visited the *Place of the Work* and carefully examined conditions affecting the *Place of the Work* and work to be done thereon, and have included in our bid price for all conditions that may affect the execution of the *Work* that are known, knowable, or reasonably inferable from such examinations, and agree and accept that no payments for extra work on account of such conditions will be allowed during the performance of the *Work*.

.9 We attach hereto a bid bond, in the form of Canadian standard construction document CCDC 220 in an amount equal to not less than 10% of our bid price. This bid bond is valid for the *Bid Acceptance Period*. The cost of this bid bond is included in our bid price.

.10 We attach hereto an agreement to bond valid for the *Bid Acceptance Period* and issued by a bonding company acceptable to *Owner* and licensed to issue such instruments in the Province of Ontario. The costs of all bonds so required are included in our bid price. This agreement to bond obliges the bonding company to issue a performance bond and a labour and material payment bond, as follows:

.1 Performance bond: CCDC 221, 100% of the bid price.

.2 Labour and material payment bond: CCDC 222, 50% of the bid price.

.11 We have included cash allowances as stipulated in the *Contract Documents*.

.12 We have completed in full and attach hereto the following bid form supplements, as supplied with the *Bid Documents*:

.1 Section 00 43 22, Unit Prices Bid Form Supplement.

.2 Section 00 43 23, Alternative Prices Bid Form Supplement.

.3 Section 00 43 36, List of Subcontractors Bid Form Supplement.

.13 We accept and agree that nothing contained in the *Bid Documents* or elsewhere, no act done or expense incurred by us in the preparation and submission of our bid, no trade or industry custom or practice, and no representation or assurance that may have been made or given to us by or on behalf of the *Owner*, shall in any manner legally bind the *Owner*, in any circumstances, to accept this bid.

.14 We accept and agree that the *Owner* shall in no event be responsible for any costs incurred by us in the preparation and submission of our bid.

1.3 Signatures

Signed and submitted by:

AVERY CONSTRUCTION LTD.
company name

BRENT AVERY - V.P.
name and title of authorized signing officer

signature of authorized signing officer

ADAM LYONS
name of witness

signature of witness

Dated this 7TH day of APRIL, 20 22.

Note: Affix corporate seal as required by *Bid Documents*.

END OF SECTION

Unit Price Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): AVERY CONSTRUCTION LTD.
company name

Signature: [signature]
Signature of authorized signing officer

Dated this 7TH day of APRIL, 20 22.

Note: Affix corporate seal as required by *Bid Documents*.

We, the above named *Bidder*, offer the unit prices requested below. The amount to be added to, or deducted from, our bid price (as entered in Section 00 41 13, previously submitted) is entered for each unit price requested. All unit prices exclude *Value Added Taxes*.

We understand, agree, and accept that unit prices will be taken into account in determining the most appropriate bidder in accordance with the rules governing bid analysis given under Section 00 21 13.

Unit Price #	Description	Unit	Unit cost for additions	Unit cost for deletions
1.	Concrete Paving (35MPa concrete incl. light sandblast finish with sawcut joints)	m^2	$ 430.61	$ 338.49
2.	Granular A (Compacted to 98% SPD, and as outlined in the specifications)	tonne	$ 23.10	$ 21.00
3.	Granular B (Compacted to 98% SPD, and as outlined in the specifications)	tonne	TYPE I $ 18.50	$ 16.82
4.	Concrete Curb (35MPa concrete light sandblast finish with sawcut joints)	Lineal m	$ 175.20	$ 159.27
5.	Asphalt Paving (HL3a and HL8 layers)	m^2	$ 69.70	$ 63.36
6.	Reinforcing Rebar (15M to current CAN/CSA-G30.18, Grade 400)	tonne	$ 5000.00	$ 3880.00

END OF SECTION

Alternative Prices Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie Downtown Plaza

From (*Bidder*): AVERY CONSTRUCTION LTD.
company name

Signature: _____
Signature of authorized signing officer

Dated this 7TH day of APRIL, 2022.

Note: Affix corporate seal as required by *Bid Documents*.

We, the above named *Bidder*, offer the alternative prices requested below. The amount to be added to, or deducted from, our bid price (as entered in Section 00 41 13, previously submitted) is entered for each alternative requested. All alternative prices exclude *Value Added Taxes*. If there is no change to the base bid price for an alternative, we have so indicated. We understand, agree, and accept that:

(a) the *Owner* shall have the right to accept any of the alternatives and corresponding alternative prices in any order or combination, including all or none,

(b) alternative prices will be considered in determining the most appropriate *Bidder* in accordance with the rules governing bid analysis given under Section 00 21 13,

(c) alternatives and alternative prices are open for acceptance by the *Owner* for the duration of the *Bid Acceptance Period*,

(d) the *Work* of the *Contract* and the *Contract Price* will reflect the alternatives and alternative prices, if any, accepted by the *Owner* at the time of contract award, and

(e) acceptance of any alternatives will not affect the *Contract Time*, unless we have specifically indicated an increase or decrease in the *Contract Time*, in number of days, on account of a particular alternative.

Alternative Price #	Description of Alternative	Amount to be added to bid price and/or Contract Time		Amount to be deducted from bid price and/or Contract Time
1.	Supply and Install Wood Fencing in lieu of Omega UNIK Metal Fence	$ 13211.00 Days		$ Days
2.	Supply and Install PVC Roofing in Lieu of TPO	$ — Days		$ — Days

Alternative Price #	Description of Alternative	Amount to be added to bid price and/or Contract Time		Amount to be deducted from bid price and/or Contract Time
3.	Delete Maglin Movable Table and Chairs from the *Work*	$ Days		$ 13,000 -- Days
4.	Delete Omega UNIK Metal Fence from the *Work*	$ Days		$ 22,095 -- Days

END OF SECTION

List of Subcontractors Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): AVERY CONSTRUCTION LTD
company name

Signature: _____
Signature of authorized signing officer

Dated this 7TH day of APRIL, 20 22.

Note: Affix corporate seal as required by *Bid Documents*.

Following is a list of *Subcontractors* we propose to use for the performance of the identified portions of the Work.

The UNDERSIGNED lists herein the individual *Subcontractor* and Major *Supplier* for the trades listed below and who he/she proposes to employ on the project, and upon whose sub-trade or supply quotation he/she based the Stipulated Sum quoted herein, and agrees that no change shall be made in the list, as regards such *Subcontractor* or *Supplier* actually employed on the work without the express written consent of the *Owner*.

Listed sub-contractors shall be actually engaged in the line of work required listed and shall be able to refer to work of similar nature completed by them.

Provide only ***ONE*** name per section.

Work to be performed by us is indicated by the words "BY OWN FORCES".

This bid form supplement forms part of the contract and failure on part of the contractor **to COMPLETE EACH SECTION FULLY** may result in the contractors bid being REJECTED.

We acknowledge that *Subcontractors* on this list maybe notified by the *Owner*.

List of Subcontractors

Trade/Division/Product	Subcontractor/Supplier
Excavation and Backfill	OWN FORCES.
Masonry	RUSCIO
Concrete Formwork	COMMERCIAL CONCRETE

Trade/Division/Product (cont.)	Subcontractor/Supplier (cont.)
Concrete Reinforcement	COMMERCIAL CONCRETE
Concrete	COMMERCIAL CONCRETE
Water Feature	**SOUCY Aquatik** Jonathan Gosselin jgosselin@soucyaquatik.com 418 781-0620 x 134
Refrigeration	**CIMCO Refrigeration** Tyler Ellis tellis@toromont.com 416 465-7581 x 3408
Playground	SUPPLIER
Electrical	Permanent
Civil	OWN FORCES
Mechanical	MCTCO
Structural Steel	STEEL SPECS
Miscellaneous Metals	STEEL SPECS
Rough Carpentry	OWN FORCES
Finish Carpentry	OWN FORCES
Architectural Woodwork	OWN FORCES
Roofing	MAVERICK + SONS
Doors and Frames	HOLLOW METAL
Curtain Wall and Windows	GLASS EMPLOYEES
Door Hardware	R&Q ~~ADVANCE~~ HOLLOW METAL
Gypsum Board Assemblies	ADVANCE
Flooring	SUPERIOR TILE
Painting	ADVANCE

Trade/Division/Product (cont.)	Subcontractor/Supplier (cont.)
Manufactured Specialties	EQUIP. WORLD
Rink Slab	COMMERCIAL CO-OP.
Plumbing	mcleod
HVAC	mcleod
Automated Controls	Permanent
Fire Alarm	Permanent
Communications	Permanent

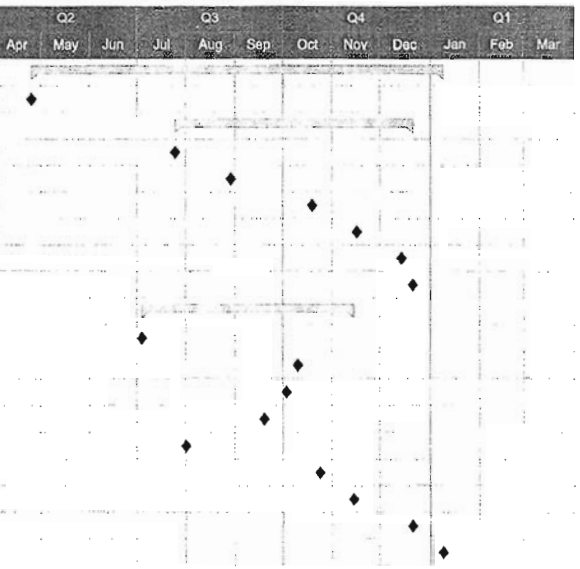
END OF SECTION

Downtown Plaza - 2022

AVERY

**Project milestones are presented based on no delays in material procurement. The current lead time for open web steel joists is 10-12 months from the time of PO being issued, these milestones reflect an alternative to the open web steel joists.

	Task Name	Duration	Start	Finish
1	Project Milestones - Downtown Plaza	180d	04/25/22	01/09/23
2	Mobilization	0	04/25/22	04/25/22
3	Building	105d	07/25/22	12/21/22
4	Building Concrete Foundations Complete	0	07/25/22	07/25/22
5	Building Structure Complete	0	08/29/22	08/29/22
6	Building Water Tight Complete	0	10/19/22	10/19/22
7	Building Fit Out Complete	0	11/16/22	11/16/22
8	Deficiency Review and Corrections Complete	0	12/14/22	12/14/22
9	Building Occupancy	0	12/21/22	12/21/22
10	Exterior	93d	07/04/22	11/14/22
11	Site Services Complete	0	07/04/22	07/04/22
12	Exterior Concrete Pavement Complete	0	10/10/22	10/10/22
13	Paving Stones Complete	0	10/03/22	10/03/22
14	Stage Complete	0	09/19/22	09/19/22
15	Exterior Electrical Complete	0	08/01/22	08/01/22
16	Asphalt Placement Complete	0	10/24/22	10/24/22
17	Deficiency Review and Corrections Complete	0	11/14/22	11/14/22
18	Substantial Complete	0	12/21/22	12/21/22
19	Final Complete	0	01/09/23	01/09/23



SAULT STE. MARIE

Project Specifications

for

Sault Ste. Marie Downtown Plaza

Tender # 2022CDE-PE-02-T

Date: 2022-02-25

prepared by:

BrookMcIlroy

BROOK MCILROY INC.
161 SPADINA AVE, 2ND FLOOR
TORONTO, ONTARIO M5V 2L6
T. 416 504 5997

1.1 Document Responsibility

.1 Refer to Project Manual, Section 00 01 10 - Table of Contents, for indication of document responsibility (DR). Abbreviations for entity responsible for document preparation are as follows:

.1 A - Denotes documents prepared by Architect.

.2 AV - Denotes documents prepared by Audio-Visual Consultant.

.3 C - Denotes documents prepared by Civil Engineer.

.4 E - Denotes documents prepared by Electrical Engineer.

.5 L - Denotes documents prepared by Landscape Architect.

.6 M - Denotes documents prepared by Mechanical Engineer.

.7 O - Denotes documents prepared by Owner.

.8 R - Denotes documents prepared by Refrigeration Consultant.

.9 S - Denotes documents prepared by Structural Engineer.

.10 W - Denotes documents prepared by Water Feature Consultant.

.2 Professional seals if applied next to company names in the project directory (below) govern only those specification sections and schedules identified by the corresponding document responsibility (DR) abbreviation in Section 00 01 10.

1.2 Project Directory

.1 Owner:

The Corporation of the City of Sault Ste. Marie
4th Floor, Civic Centre, 99 Foster Drive
Sault Ste. Marie, Ontario
P6A 5X6

Tel: 705-759-5299

.2 Architect (the *Consultant*):

Brook McIlroy Incorporated
200-161 Spadina Avenue
Toronto, Ontario
M5V 2L6

Tel: 416-504-5997

.3 Structural Engineer:

Tulloch Engineering
71 Black Road #8
Sault Ste. Marie, Ontario
P6B 0A3

Tel: 705-949-1457

.4 Mechanical Engineer:

MGP Architects and Engineers
123 East Street
Sault Ste. Marie, Ontario
P6A 3C7

Tel: 705-942-9494

.5 Electrical Engineer:

Mulvey & Banani International Incorporated
90 Sheppard Avenue East #500
Toronto, Ontario
M2N 3A1

Tel: 416-751-2520
Fax: 416-751-1430

.6 Civil Engineer:

Tulloch Engineering
71 Black Road #8
Sault Ste. Marie, Ontario
P6B 0A3

Tel: 705-949-1457

.7 Audio-Visual Consultant:

Mulvey & Banani International Incorporated
90 Sheppard Avenue East #500
Toronto, Ontario
M2N 3A1

Tel: 416-751-2520
Fax: 416-751-1430

.8 Landscape Architect

Brook McIlroy Incorporated
200-161 Spadina Avenue
Toronto, Ontario
M5V 2L6

Tel: 416-504-5997

.9 Water Feature Consultant

Crystal Fountains
60 Snow Boulevard #3
Toronto, Ontario
L4K 4B3

Tel: 905-660-6674

.10 Refrigeration Consultant

CIMCO TOROMONT
65 Villiers Street
Toronto, Ontario
M5A 3S1

Tel: 416-465-7581

END OF SECTION

Table of Contents

DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

Document Identification		DR	Pgs	Issued
DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS				
00 01 05	Document Responsibility and Project Directory	A	3	February 25, 2022
00 01 10	Table of Contents	A	3	February 25, 2022
00 21 13	Instructions to Bidders	A	11	February 25, 2022
00 31 00	Information Available for Review	O	1	February 25, 2022
00 41 13	Stipulated Price Bid Form	A	3	February 25, 2022
00 43 22	Unit Price Bid Form Supplement	A	1	February 25, 2022
00 43 23	Alternative Prices Bid Form Supplement	A	2	February 25, 2022
00 43 36	List of Subcontractors Bid Form Supplement	A	3	February 25, 2022
DIVISION 01 - GENERAL REQUIREMENTS				
01 11 00	Summary of Work	A	6	February 25, 2022
01 21 00	Allowances	A	2	February 25, 2022
01 25 00	Substitution Procedures	A	3	February 25, 2022
01 26 00	Contract Modification Procedures	A	4	February 25, 2022
01 29 00	Payment Procedures	A	2	February 25, 2022
01 31 00	Project Management and Coordination	A	4	February 25, 2022
	RFI Form	A	1	February 25, 2022
01 31 19	Project Meetings	A	6	February 25, 2022
01 32 00	Construction Progress Documentation	A	6	February 25, 2022
01 33 00	Submittal Procedures	A	9	February 25, 2022
01 45 00	Quality Requirements	A	7	February 25, 2022
01 51 00	Temporary Utilities	A	2	February 25, 2022
01 52 00	Temporary Facilities	A	3	February 25, 2022
01 56 00	Temporary Barriers and Enclosures	A	3	February 25, 2022
01 57 00	Temporary Controls	A	6	February 25, 2022
01 60 00	Product Requirements	A	3	February 25, 2022
01 71 00	Examination and Preparation	A	3	February 25, 2022
01 73 00	Execution	A	6	February 25, 2022
01 73 29	Cutting and Patching	A	3	February 25, 2022
01 74 00	Cleaning and Waste Management	A	4	February 25, 2022
01 77 00	Closeout Procedures	A	4	February 25, 2022
01 78 00	Closeout Submittals	A	5	February 25, 2022
01 78 36	Warranties	A	1	February 25, 2022
01 79 00	Demonstration and Training	A	2	February 25, 2022
DIVISION 02 – EXISTING CONDITIONS				
02 50 13	Management of Toxic Waste	L	3	February 25, 2022
02 61 33	Hazardous Materials	L	3	February 25, 2022
DIVISION 03 - CONCRETE				
03 30 00	Cast-In-Place Concrete	L	8	February 25, 2022
03 35 00	Concrete Floor Finishing	A	4	February 25, 2022
03 48 00	Architectural Precast Concrete Fabrications	A	3	February 25, 2022

Table of Contents

DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

Document Identification		DR	Pgs	Issued
DIVISION 04 - MASONRY				
04 27 00	Concrete Masonry Unit Assemblies	A	12	February 25, 2022
DIVISION 05 - METALS				
05 41 13	Lateral Load-Bearing Cold-Formed Metal Framing	A	5	February 25, 2022
05 50 00	Metal Fabrications	L	5	February 25, 2022
05 51 00	Metal Fabrications - Architectural	A	6	February 25, 2022
DIVISION 06 - WOOD, PLASTIC, AND COMPOSITES				
06 10 53	Rough Carpentry	A	4	February 25, 2022
06 40 13	Wood Benches	A	4	February 25, 2022
DIVISION 07 - THERMAL AND MOISTURE PROTECTION				
07 11 13	Bituminous Dampproofing	A	2	February 25, 2022
07 18 13	Service Room Traffic Coatings	A	5	February 25, 2022
07 21 00	Thermal Insulation	A	5	February 25, 2022
07 26 13	Above-Grade Vapour Barrier	A	3	February 25, 2022
07 26 16	Below-Grade Vapour Barrier	A	3	February 25, 2022
07 27 00	Air Barrier Systems	A	5	February 25, 2022
07 46 19	Metal Roofing Systems	A	8	February 25, 2022
07 46 46	Fibre Reinforced Cement Panels	A	6	February 25, 2022
07 54 19	Polyvinyl-Chloride (PVC) Roofing	A	13	February 25, 2022
07 54 23	Thermoplastic-Polyolefin (TPO) Roofing	A	11	February 25, 2022
07 62 00	Metal Flashing	A	7	February 25, 2022
07 84 00	Joint Firestopping and Smoke Seals	A	6	February 25, 2022
07 92 00	Joint Sealants	A	9	February 25, 2022
DIVISION 08 - OPENINGS				
08 11 13	Steel Doors and Frames	A	12	February 25, 2022
08 41 00	Aluminum Entrances and Storefront	A	8	February 25, 2022
08 71 00	Finish Hardware	A	5	February 25, 2022
08 80 00	Glass and Glazing	A	11	February 25, 2022
DIVISION 09 - FINISHES				
09 22 00	Metal Supports for Gypsum Board	A	7	February 25, 2022
09 29 00	Gypsum Board	A	13	February 25, 2022
09 31 00	Tiling	A	13	February 25, 2022
09 51 23	Acoustical Tile Ceiling Systems	A	6	February 25, 2022
09 65 66	Resilient Athletic Flooring	A	5	February 25, 2022
09 68 00	Carpet	A	7	February 25, 2022
09 91 00	Painting	A	10	February 25, 2022
DIVISION 10 - SPECIALTIES				
10 28 00	Washroom and Janitor Accessories	A	3	February 25, 2022
10 51 13	Prefinished Metal Lockers	A	2	February 25, 2022

Table of Contents

DR - indicates entity responsible for preparation of listed documents (see Section 00 01 05)

Document Identification		DR	Pgs	Issued
DIVISION 12 - FURNISHINGS				
12 48 16	Entrance Floor Grilles	A	2	February 25, 2022
DIVISION 20 – MECHANICAL				
Refer to Mechanical Specification for Indices		M	91	February 25, 2022
DIVISION 26 – ELECTRICAL				
26 50 00	Luminaires	E	43	February 24, 2022
DIVISION 31 - EARTHWORK				
31 05 17	Aggregate Materials	L	6	February 25, 2022
31 23 00	Excavation and Backfill	A	4	February 25, 2022
31 23 13	Rough Grading	L	3	February 25, 2022
31 23 17	Excavating, Trenching, and Backfill	L	5	February 25, 2022
31 25 00	Erosion and Sediment Control	L	3	February 25, 2022
31 32 21	Geotextiles	L	3	February 25, 2022
DIVISION 32 – EXTERIOR IMPROVEMENTS				
32 01 91	Tree and Shrub Preservation	L	6	February 25, 2022
32 12 17	Asphalt Paving	L	5	February 25, 2022
32 13 10	Unit Paving	L	6	February 25, 2022
32 13 15	Concrete Walks, Curbs, and Gutters	L	3	February 25, 2022
32 17 23	Pavement Markings	L	2	February 25, 2022
32 18 16	Playground Surfacing Tiles	L	6	February 25, 2022
32 37 00	Site Furnishings	L	4	February 25, 2022

END OF SECTION

1. TECHNICAL DRAWINGS

Drawing	Title
LANDSCAPE	
L0.00	LANDSCAPE DRAWING INDEX
L1.00	EXISTING FEATURES AND DEMOLITION PLAN (N.I.C)
L2.00	OVERALL LANDSCAPE PLAN
L2.01	MATERIALS AND FURNISHINGS PLAN A
L2.02	MATERIALS AND FURNISHINGS PLAN B
L2.03	ASPHALT PAINTING ENLARGEMENT
L2.04	PLAYGROUND EQUIPMENT PLAN
L3.00	LAYOUT POINTS SCHEDULE
L3.01	LAYOUT PLAN A
L3.02	LAYOUT PLAN B
L4.00	LANDSCAPE DETAILS – PAVING
L4.01	LANDSCAPE DETAILS – FURNITURE
L4.02	LANDSCAPE DETAILS – AMPHITHEATRE
L4.03	LANDSCAPE DETAILS – SKATING RINK
L4.04	LANDSCAPE DETAILS – STAGE
L4.05	LANDSCAPE DETAILS – STAGE STRUCTURE
L4.06	LANDSCAPE DETAILS – METAL SCREEN
CIVIL	
C1	EXISTING SITE PLAN AND REMOVALS
C2	GRADING PLAN
C3	SITE SERVICING PLAN
C4	NOTES AND DETAILS
ARCHITECTURE	
A001	OBC, GENERAL NOTES AND LIFE SAFETY
A002	CONSTRUCTION ASSEMBLIES
A003	DOOR, FRAME AND GLAZING SCHEDULE
A004	OCB W/C DIAGRAMS
A005	LEGENDS AND FINISH SCHEDULE
A101	SITE PLAN
A200	BASEMENT PLAN

A201	GROUND FLOOD PLAN
A202	ROOF PLAN
A210	RCP- BASEMENT
A211	RCP- GROUND FOOR
A301	EXTERIOR ELECATIONS
A302	EXTERIOR ELEVATIONS
A401	BUILDING SECTIONS
A501	STAIR DRAWINGS
A502	STAIR DRAWINGS
A601	WALL SECTIONS
A602	WALL SECTIONS
A701	PLAN DETAILS
A801	SECTION DETAILS
A802	SECTION DETAILS
A901	INTERIORS
A902	INTERIORS
A1101	MILLWORK

STRUCTURAL

S1	SERVICE BUILDING STRUCTURAL GENERAL NOTES
S2	SERVICE BUILDING STRUCTURAL GENERAL NOTES
S3	SERVICE BUILDING STRUCTURAL FOUNDATION PLAN
S4	SERVICE BUILDING STRUCTURAL GROUND FLOOR PLAN
S5	SERVICE BUILDING STRUCTURAL ROOF PLAN
S6	SERVICE BUILDING STRUCTURAL FOUNDATION SECTIONS
S7	SERVICE BUILDING STRUCTURAL FOUNDATION SECTIONS
S8	SERVICE BUILDING STRUCTURAL BUILDING SECTIONS
S9	SERVICE BUILDING STRUCTURAL ROOF SECTIONS AND DETAILS
S10	SERVICE BUILDING STRUCTURAL O/H DOOR SECTIONS & DETAILS

ELECTRICAL

E-001	LEGEND AND DRAWING INDEX
E-002	ELECTRICAL SPECIFICATIONS
E-003	ELECTRICAL SPECIFICATIONS
E-101	SITE PLAN- ELETRICAL
E-201	SERVICE BUILDING BASEMENT- LIGHTING
E-202	SERVICE BUILDING GROUND FLOOR- LIGHTING
E-301	SERVICE BUILDING BASEMENT- POWER AND SYSTEMS
E-302	SERVICE BUILDING GROUND FLOOR- POWER AND SYSTEMS
E-303	SERVICE BUILDING ROOF- ELECTRICAL
E-500	POWER DISTRIBUTION SINGLE LINE RISER DIAGRAM

E-501	ELECTRICAL DETAILS
E-601	ELECTRICAL DETAILS
E-602	ELECTRICAL DETAILS
E-603	PANELBOARD SCHEDULES
E-604	PANELBOARD SCHEDULES

MECHANICAL

M0.1	PLUMBING NOTES, SCHEDULES DETAILS AND LEGENDS
M0.2	HVAC NOTES, SCHEDULES & LEGENDS
M0.3	HVAC UNITS PLANS & SECTIONS WATER METER DETAIL
M1.1	SANITARY AND DRAINAGE/DCW/DHC PIPING PLAN
M1.2	BASEMENT DCW/STORM/HEATING PLAN
M4.1	GROUND FLOOR HVAC DUCTWORK AND ROOF NATURAL GAS PIPING PLAN
M7.0	CONTROLS DRAWING

REFRIGERATION

R1000	SKATE PAD REFRIGERATION SYSTEM GENERAL NOTES, SPECIFICATIONS & PIPING IDENTIFICATION
R1001	SKATE PAD REFRIGERATION SYSTEM EQUIPMENT & PIPING FLOW DIAGRAM (1 OF 2)
R1002	SKATE PAD REFRIGERATION SYSTEM EQUIPMENT & PIPING FLOW DIAGRAM (2 OF 2)
R1003	SKATE PAD REFRIGERATION SYSTEM SINGLE RISER ELETRICAL DIAGRAM
R2001	SKATE PAD REFRIGERATION SYSTEM MECHANICAL ROOM LAYOUT
R2002	SKATE PAD REFRIGERATION SYSTEM MECHANICAL ROOM ROOF LAYOUT
R2003	SKATE PAD REFRIGERATION SYSTEM MECHANICAL ROOM PIPING LAYOUT
R2004	SKATE PAD REFRIGERATION SYSTEM MECHANICAL ROOM ROOF PIPING LAYOUT
R2005	SKATE PAD REFRIGERATION SYSTEM COOLING GLYCOL, MAINS AND HEADS LAYOUT
R3000	SKATE PAD REFRIGERATION SYSTEM RINK SECTIONS

AUDIO VISIAL

AV-001	AUDIO VISUAL LEGEND, DRAWING LIST AND GENERAL NOTES
AV-101	SITE PLAN- AUDIO VISUAL

AV-401	AUDIO VISUAL FUNCTIONAL DIAGRAM
AV-501	AUDIO VISUAL INFRASTRUCTURE RISER
AV-701	AUDIO VISUAL DETAILS
AV-003	AUDIO VISUAL SPECIFICATION SECTION 27 41 16 AUDIO VISUAL SYSTEMS
AV-301	SERVICE BUILDING BASEMENT- AUDIO VISUAL SYSTEMS
AV-702	AUDIO VISUAL DETAILS

PART 1 - GENERAL

1.1 General

.1 Name of *Owner*: The Corporation of the City of Sault Ste. Marie.

.2 *Bidder*: is defined as the company submitting a bid to the *Owner* in response to the *Owner's* invitation to bid.

1.2 The *Bid Documents*

.1 The *Bid Documents* shall be defined as comprising the following documents:

.1 Section 00 21 13 Instructions to *Bidders*.

.2 Section 00 31 00 Information Available for Review.

.3 Section 00 41 13 Stipulated Price Bid Form.

.4 Section 00 43 22 Unit Prices Bid Form Supplement.

.5 Section 00 43 23 Alternative Prices Bid Form Supplement.

.6 Section 00 43 36 List of Subcontractors Bid Form Supplement.

.7 Addenda issued prior to *Bid Closing Time*.

.8 Agreement between *Owner* and *Contractor* in the form of CCDC 2 - 2020.

.9 Definitions given in CCDC 2 - 2020.

.10 General Conditions of CCDC 2 - 2020.

.11 Specifications as listed in Section 00 01 10 of the project manual for this project.

.12 Schedules as listed in Section 00 01 10 of the project manual and as listed in the list of drawings.

.13 Drawings as listed in the list of drawings given on Drawing A000.

1.3 The *Contract Documents*

.1 The *Contract Documents* shall be defined as comprising the following documents:

.1 Addenda.

.2 Agreement between *Owner* and *Contractor* in the form of CCDC 2 - 2020.

.3 Definitions given in CCDC 2 - 2020.

.4 General Conditions of CCDC 2 - 2020.

.5 Specifications as listed in Section 00 01 10 of the project manual for this project.

.6 Schedules as listed in Section 00 01 10 of the project manual and as listed in the list of drawings.

.7 Drawings as listed in the list of drawings given on Drawing A000.

1.4 Location for Receiving Bids and *Bid Closing Time*

.1 Location for receiving bids:

.1 Bids shall be received by the *Owner* before the *Bid Closing Time* at the following location:

The Corporation of the City of Sault Ste. Marie
Attention: City Clerk
4th Floor, Civic Centre, 99 Foster Drive
Sault Ste. Marie, Ontario P6A 5X6.

.2 *Bid Closing Time*:

.1 The *Bid Closing Time* is defined as the time and date before which bids shall be received by the *Owner*, namely:

.1 Before 12:00 pm (noon) local time, as determined by the clock located in location for receiving bids on March 30th, 2022.

.2 Any bid received at 12:00 pm (noon) local time on March 30th, 2022 will be declared a bid received after the *Bid Closing Time*.

.3 Any bid received after 12:00 pm (noon) local time on March 30th, 2022 will be declared a bid received after the *Bid Closing Time*.

1.5 Private Bid Opening

.1 The bid opening will be a private bid opening.

.2 Bid opening information, as described below, will be made available by the *Owner* within 3 days after the *Bid Closing Time*.

.3 Bid opening information: The names of the *Bidders*, the bid prices and confirmation of receipt of required bid securities only will be announced.

.4 In the event that more than one envelope is received from the same *Bidder* for the main bid, or more than one envelope is received from the same *Bidder* for the bid form supplements, the envelope bearing the latest time and date mark prior to the *Bid Closing Time* will be considered the intended bid and any other envelopes received from the same *Bidder* will be returned unopened.

1.6 Bid Submission Requirements

.1 Bids must be received by the *Owner* before the *Bid Closing Time*, with bid form supplements submitted at times relative to the *Bid Closing Time* as described below.

.2 Bids will be time and date marked upon receipt at the location specified for receipt of bids. The *Bidder* shall be solely responsible for verifying that its bid is correctly time and date marked.

.3 Bids shall be submitted in sealed envelopes clearly labelled as follows:

.1 "Tender for: Sault Ste. Marie Downtown Plaza
File #: City File # 2022CDE-PE-02-T; FBMI 19-076"

.4 Bids shall remain sealed until receipt of bid form supplements as listed in Section 00 41 13.

.5 Bids must be submitted on Section 00 41 13 and prescribed bid form supplements as listed in Section 00 41 13, as required, furnished with *Bid Documents*. Fill-in blanks on such documents and forms.

.6 The *Bidder* shall present the bid price in figures.

.1 The stipulated bid price shall include the cost of all *Products*, materials, labour, equipment, delivery, storage, handling, statutory charges, overhead and profit, other related charges, and inclusive of all duties and taxes applicable, except *Value Added Taxes*, and all other charges on account of such work, measured complete in place for all parts of the *Work*.

.7 Documents and forms submitted must be legible, written in ink or typewritten, and all items must be bid. Any form of erasure, strikeout, or overwriting must be initialled by the *Bidder's* authorized signing officer.

.8 Bids submitted must be signed in ink and sealed. Incorporated companies shall affix their corporate seal and have bid signed by their duly authorized officers.

.9 Bids must not be restricted by a covering letter, a statement added, or by alterations not called for.

.10 Each bid shall include a completed Section 00 41 13, as required, a bid bond, and an agreement to bond, as required herein, together with any bid form supplements that *Bidder* is instructed elsewhere herein, or in any addendum hereto, to submit with its bid.

.11 In no event will the *Owner* be responsible for any costs incurred by anyone in the preparation and/or submission of a bid, including costs for printing copies of the *Bid Documents*.

.12 By submitting a bid, a *Bidder* agrees to each and every of the terms, provisions and conditions set out in the *Bid Documents*.

1.7 Withdrawal of Bids Prior to *Bid Closing Time*

.1 A *Bidder* who has submitted a bid may request that its bid be withdrawn.

.1 The withdrawal shall be allowed if request is made before the *Bid Closing Time*. Withdrawal requests must be directed to the *Owner*, to the attention of City Clerk by hard-copy.

.2 Authenticity of the withdrawal request must be confirmed by a responsible official of the *Bidder* who will be contacted at the time of bid withdrawal by the *Owner*.

.3 Where a bid withdrawal request is received and confirmed for a bid that has already been received by the *Owner*, the bid so withdrawn will be returned unopened to the *Bidder* after the bid opening, together with copies of the withdrawal request and confirmation. At the bid opening, such bids shall be announced as withdrawn and shall not be opened.

1.8 *Bidder* Inquiries and Issuance of Addenda

.1 Questions concerning the *Bid Documents* are to be forwarded by email to the City of Sault Ste. Marie, to the attention of Don McConnell, email address: d.mcconnell@cityssm.on.ca.

.2 The *Owner* and *Consultant* will be responsible for clarifications of *Bid Documents* only as incorporated into addenda as issued to holders of *Bid Documents* on record at the offices of the *Owner*.

.3 Questions are due 12:00 pm (noon), local time, on March 11, 2022.

.4 Addenda will be issued no later than 5:00 pm, local time, on the 3rd *Working Day* prior to the date of the *Bid Closing Time*.

.5 *Bidders* shall notify *Owner*, in writing prior to *Bid Closing Time*, of the following:

.1 Discrepancies or omissions found in the *Bid Documents*.

.2 Clarifications required regarding the meaning of requirements contained in the *Bid Documents*.

.6 The *Owner* may issue written addenda to registered holders of the *Bid Documents*.

.7 Where apparent discrepancies are identified by *Bidders* among the various parts of the *Bid Documents*, and in the absence of addenda addressing such apparent discrepancies, *Bidders* shall allow for the greater amount of labour required and/or materials referred to, including increased bonding and insurance requirements, as applicable, when preparing their bid.

1.9 Bonding Requirements

.1 Bonds shall be issued by a bonding company acceptable to *Owner* and licensed to issue such instruments in the Province of Ontario.

.2 Bid Bond:

.1 Each *Bidder* shall submit with its bid a bid bond, in the form of CCDC 220, or Certified Cheque, or Irrevocable Letter of Credit (payable to the City of Sault Ste. Marie) in an amount equal to not less than 10% of the bid price, and naming the *Owner* as the Obligee.

.2 The bid bond shall be valid for *Bid Acceptance Period*.

.3 The bid bonds, with the exception of those of the *Bidders* submitting the two most appropriate bids, in the *Owner's* absolute discretion, will be returned within 10 *Working Days* after the *Bid Closing Time*.

.4 The bid bonds of the *Bidders* submitting, in the *Owner's* sole and absolute discretion, the two most appropriate bids will be returned when the *Bidder* to whom the *Owner* has issued the notification of conditional award of the *Contract* described later in this section, has fully complied with the conditions pertaining to *Contract* award described in the *Bid Documents* and the notification of conditional award of the *Contract*. If the *Bidder* so notified refuses or neglects to comply with the said conditions, the *Owner* may, at its sole discretion, claim against the bid bond, and the bid bond shall be subject to forfeiture, not as penalty, but as liquidated damages sustained. The *Owner* shall then have the right to award the *Contract* to the *Bidder* submitting, in the *Owner's* sole and absolute discretion, the next most appropriate bid, or to re-offer the invitation to submit bids.

.3 Agreement to Bond:

.1 Each *Bidder* shall submit with its bid an agreement to bond issued by a bonding company acceptable to *Owner* and licensed to issue such instruments in the Province of Ontario, obliging bonding company to issue a performance bond and a labour and material payment bond, each naming the *Owner* as the Obligee, in the amounts and in the forms as follows:

.1 Performance bond:

.1 Amount: 100% of the bid price.

.2 Form: CCDC 221 Performance Bond.

.2 Labour and material payment bond:

.1 Amount: 50% of the bid price.

.2 Form: CCDC 222 Labour and Material Payment Bond.

.2 The agreement to bond shall be valid for *Bid Acceptance Period*.

.4 Costs for bonds are included in the stipulated price bid.

1.10 The *Bid Acceptance Period*

.1 The *Bid Acceptance Period* is defined as a period of up to, and including, 60 days, commencing at the *Bid Closing Time*, during which bids shall be irrevocable and open to acceptance by *Owner*.

1.11 Pre-Bid Meeting

Not applicable.

1.12 *Bid Documents* Availability

.1 Complete sets of *Bid Documents* shall be made available from Sault Ste. Marie Construction Association website ssmca.com, or by contacting the City of Sault Ste. Marie purchasing office by email to purchasing@cityssm.on.ca.

.1 *Bid Documents* will be supplied as complete sets only.

1.13 Completion Time

.1 *Bidders* shall state the completion time in the space provided in Section 00 41 13. The completion time shall be stated as the number of weeks within which the *Bidder* proposes to complete the *Work* from notification of conditional award of the *Contract* to the *Bidder* by the *Owner*. The completion time stated by the *Bidder* shall form the basis of the *Contract Time*.

.1 Timing of the performance of the *Work* is a vital concern to the *Owner*. As a result, the completion time as set out by *Bidders* in Section 00 41 13 will be a factor that may be considered by the *Owner* in determining the most appropriate *Bidder*.

1.14 Examination of the *Bid Documents* and the *Place of the Work*

.1 It is the responsibility of the *Bidder* to examine the *Bid Documents* carefully and immediately upon receipt to verify that the set of *Bid Documents* that has been received by the *Bidder* is complete in all respects. Any omissions shall be brought to the attention of the *Owner* following the procedures prescribed in this section (above) for *Bidder* inquiries.

.1 No payments for extra work will be allowed where such extra work is the result of the *Bidder* using an incomplete set of *Bid Documents* in the preparation of their *Bid*.

.2 *Bidders* shall examine the complete *Bid Documents* and shall also visit the *Place of the Work* and carefully examine conditions affecting the *Place of the Work* and work to be done thereon.

.3 It is the responsibility of the *Bidder* to make an estimate of the difficulties to be encountered in performing the *Work*. If investigative work is carried out at the *Place of the Work* by *Bidders*, *Bidders* undertaking such investigative work shall make good the *Place of the Work* to the condition that it was in before the investigation was made. The *Bidder* shall be responsible for damage and claims resulting from that investigation.

.4 The levels and other information provided in the *Bid Documents* are furnished in good faith for the use and guidance of the *Bidder* in the preparation of their bid, but shall in no way relieve the *Bidder* of the responsibility of ascertaining to their own satisfaction the nature of conditions existing at the *Place of the Work*.

.5 No payments for extra work will be allowed for conditions known, knowable, or reasonably inferable from a thorough examination of the *Bid Documents* or the *Place of the Work* prior to the *Bid Closing Time*, nor for existing conditions noted in Section 00 31 00.

1.15 Availability of *Products*

.1 *Products* that are specified by their proprietary names or by part or catalogue number form the basis of the *Contract*. No substitutes for such *Products* may be used without *Consultant's* prior acceptance in writing.

.2 Prior to submitting bid, *Bidders* shall review *Product* delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of *Products* are likely or possible, notify *Consultant* of such, in order that substitutions or other remedial action may be contemplated.

.3 In the event of failure to notify the *Consultant* prior to submitting bid of potential delays in supply of *Products*, and should it subsequently appear that the *Work* may be delayed for such reason, the *Consultant* reserves the right to substitute more readily available *Products* of similar character, at the *Contractor's* cost and at no additional cost to the *Owner*

1.16 Bid Form Supplements

.1 The following bid form supplements form an integral part of Section 00 41 13:

.1 Section 00 43 22 Unit Prices Bid Form Supplement.

.2 Section 00 43 23 Alternative Prices Bid Form Supplement.

.3 Section 00 43 36 List of Subcontractors Bid Form Supplement.

.2 Bid form supplements shall be submitted together with Bid Form.

.3 Bid form supplements shall be signed, sealed, and dated in the same manner as Section 00 41 13.

.4 The requirements for completing bid form supplements, and the effect that the bid form supplements will have in the evaluation of bids, shall be as described hereunder.

.5 Section 00 43 22 Unit Prices Bid Form Supplement:

.1 *Bidders* shall make an entry against each unit price listed.

.2 Unit prices included supply and installation, unless otherwise indicated, and are based on work indicated in the *Bid Documents*.

.3 Unit prices shall be firm for the duration of the *Work*.

.4 Included in unit prices are materials, labour, equipment, delivery handling, statutory charges, overhead and profit, other related charges, and inclusive of all duties and taxes applicable, except *Value Added Taxes*, and similar charges on account of such work, measured complete in place.

.5 Provide unit prices in given measure only.

.6 Unit prices are not included in the bid price.

.7 Unit prices will be considered in determining the most appropriate *Bidder*.

.6 Section 00 43 23 Alternative Prices Bid Form Supplement:

.1 *Bidders* shall make an entry against each alternative price listed. The amount to be added to, or deducted from, the bid price shall be entered for each alternative requested.

.2 The alternative prices bid shall be inclusive of costs of carrying out the *Work* described in accordance with the applicable parts of the *Contract Documents*, and shall include the costs of all *Products*, materials, labour, equipment, delivery, storage, handling, statutory charges, overhead and profit, other related charges, and shall include of all duties and taxes applicable, except *Value Added Taxes*, and all other charges on account of such work, measured complete in place for all parts of the *Work* affected by the alternative price.

.3 Alternatives and alternative prices shall be open for acceptance by the *Owner* for the duration of the *Bid Acceptance Period*.

.4 The *Work* of the *Contract* and the *Contract Price* will reflect the alternatives and alternative prices, if any, accepted by the *Owner* at the time of *Contract* award.

.5 Acceptance of any alternatives will not affect the *Contract Time*, unless *Bidders* have specifically indicated an increase or decrease in time, in number of days, on account of a particular alternative in their bid.

.6 The *Owner* shall have the right to accept any of the alternatives and corresponding alternative prices in any order or combination, including all or none.

.7 Alternative prices will be considered in determining the most appropriate *Bidder*.

.7 Section 00 43 36 List of Subcontractors Bid Form Supplement:

.1 *Bidders* shall submit the names of *Subcontractors* and major *Suppliers* that they are proposing to use in the execution of the *Work* by making an entry in each space provided on the bid form supplement, including stating "By Own Forces" (meaning under the direct employ of the *Bidder*) where applicable.

.2 In submitting Section 00 43 36, *Bidders* represent that the *Subcontractors* and major *Suppliers* listed each meet or exceed the qualification requirements specified in the *Contract Documents* pertaining to the parts of the *Work* for which they have been listed. Should it subsequently be found that a *Subcontractor* or major *Supplier* does not meet the qualification requirements specified in the *Contract Documents* pertaining to the parts of the *Work* for which the *Subcontractor* or major *Supplier* has been listed, the *Contractor* shall replace the unqualified *Subcontractor* or major *Supplier* with a qualified *Subcontractor*, or major *Supplier* satisfactory to the *Contractor* and to the *Owner*, at no additional cost to the *Owner* and at no increase in the *Contract Time*.

.3 Once Section 00 43 36 has been submitted in accordance with the requirements of Section 00 21 13, the *Subcontractors* and major *Suppliers* listed may not be changed except with the written consent of the *Consultant* and the *Owner*.

1.17 *Bidder*'s Proposed Alternatives

.1 Submit bids for work only as indicated in the *Bid Documents*. Unsolicited alternatives may be proposed by *Bidder* during bid period. Submit proposals at least 10 *Working Days* prior to the *Bid Closing Time* to allow for review, and for incorporation into an addendum, if accepted.

.2 The *Owner* will not necessarily accept alternatives proposed by *Bidder*.

1.18 *Owner's* Budget

.1 The *Owner* reserves the right not to award the *Contract* should the bids received exceed the *Owner's* budget for the *Work*.

1.19 Award of *Contract*

.1 Bid analysis and evaluation:

.1 The *Owner* reserves the right to reject any or all bids, including without limitation the lowest bid, and to award the *Contract* to whomever the *Owner* in its sole and absolute discretion deems appropriate and in the best interests of the *Owner* notwithstanding any custom of the trade to the contrary.

.2 The *Owner* reserves the right to include for consideration, and may award the *Contract* to a *Bidder* submitting, a bid that is substantially compliant with the terms and conditions of the *Bid Documents*. Bids that are non-compliant will not be considered by the *Owner*.

.1 Bids containing errors or omissions not listed under paragraph 1.19.1.4 will be declared substantially compliant.

.3 In determining the most appropriate bid, the criteria considered by the *Owner* will include, but will not be limited to, the following (in no particular order):

.1 Bid price.

.2 Completion time.

.3 Unit prices.

.4 Alternative prices.

.4 Bids containing the following errors or omissions, in no particular order, will be declared non-compliant:

.1 Bid received after the *Bid Closing Time* (which bids will be returned unopened).

.2 Bid not received in hard copy at the location prescribed for the receipt of bids by the *Bid Documents*.

.3 Bid received by fax, by email, or by any other electronic means.

.4 Bid not submitted in sealed envelope (whether envelope was provided by *Owner* or by *Bidder*).

.5 Bid does not include bid bond in form and amount prescribed by the *Bid Documents*.

.6 Bid does not contain agreement to bond in form and amount prescribed by the *Bid Documents*.

.7 Bid where evidence of collusion, intent to defraud, or illegal practices on the part of a *Bidder* is presented or discovered.

.8 Bid has been qualified by any condition other than those prescribed by the *Bid Documents*.

.9 Section 00 41 13 Stipulated Price Bid Form is omitted or incomplete.

.10 Section 00 41 13 Stipulated Price Bid Form is not dated, unsigned, not sealed, improperly signed, improperly sealed, illegible, obscure, or contains erasures or alterations not called for.

.11 Section 00 41 13 Stipulated Price Bid Form does not contain acknowledgement of examination of all addenda issued.

.12 Section 00 43 22 Unit Prices Bid Form Supplement omitted or incomplete, not signed, or not dated.

.13 Section 00 43 23 Alternative Prices Bid Form Supplement omitted or incomplete, not signed, or not dated.

.14 Section 00 43 36 List of Subcontractors Bid Form Supplement incomplete, omitted, not signed, or not dated.

.2 *Contract* Award:

.1 Delivery by registered mail or common carrier, to the address given by the *Bidder* in its bid on Section 00 41 13, of notification of conditional award of the *Contract* to the *Bidder* by the *Owner* shall constitute acceptance of said bid and notice of award of the *Contract* by the *Owner* to the *Bidder* to the extent described by the notice of conditional award.

.2 It is intended that a *Contract* will be awarded within the *Bid Acceptance Period. Contract Documents* will be prepared for signature immediately following *Contract* award and are to be signed within 7 days of *Contract* award. *Contractor's* organization and mobilization at the *Place of the Work* may be permitted prior to signing of *Contract*.

.3 If *Bidder* has not been so notified within the *Bid Acceptance Period*, the *Bidder* may, unless *Bidder* has otherwise agreed or offered and except as otherwise provided herein, withdraw its bid without penalty, forfeiture, or obligation to the *Owner* or any kind.

.4 The *Bidder* accepts and agrees that, upon receipt of the notice of conditional award of *Contract*, the *Bidder* will comply with the conditions stipulated by the notice of conditional award of *Contract*.

.5 The *Bidder* accepts and agrees that, upon fulfillment to the satisfaction of the *Owner* of the above noted requirements, and any other conditions described by the notice of conditional award, the *Owner* will provide written authorization to the *Bidder* to commence the *Work* and that, upon receipt of such authorization, the *Bidder* will, within 10 *Working Days*, commence the *Work* actively at the *Place of the Work.*

1.20 Bonds and Insurance

.1 The *Bidder* shall submit to the *Owner*, within 7 days from the date of receipt of notice of conditional award of *Contract*, the performance and labour and material payment bonds, each in amounts and in the forms described above.

.2 The *Bidder* shall submit to the *Owner*, within 7 days from the date of receipt of notice of conditional award of *Contract*, proof that it has in place the various types of insurance as required by the *Contract*.

.3 Submission of the performance and labour and material payment bonds and proofs of insurance shall be a condition of the award of the *Contract* to the extent described in the notice of conditional award of *Contract* referenced above.

1.21 Contractor Safety

.1 The successful Bidder is required to comply with the requirements of the City's Contractor Pre-Qualification Program prior to the start of onsite work on this Contract. These requirements include but are not limited to WSIB Coverage, Liability Insurance Coverage, Accessibility Training, and Safe Work Practices. Furthermore, the City's Vaccination Policy also applies to contractors while they are working on City Workplaces, or directly with our employees. Details regarding compliance with this requirement may be obtained by contacting Shelley Olar, Risk Manager, telephone 705-759-5768 or by email to s.olar@cityssm.on.ca. Responsibility for compliance with this requirement for its Subcontractors is the responsibility of the successful Contractor.

1.1 Information Available for Review

.1 The following documents are made available for review:

.1 Geotechnical report(s):

.1 "Geotechnical Report Sault Ste. Marie Downtown Civic Plaza Development Sault Ste. Marie, Ontario", dated February 5, 2020, prepared by Tulloch Engineering.

.2 Environmental site assessment reports:

.1 "Verification Soil Sampling Program 535 Queen Street East, Sault Ste. Marie, Ontario – Historic Contamination", dated December 10, 2021, prepared by Tulloch.

.2 "Verification Soil Sampling Program 526 Bay Street, Sault Ste. Marie, Ontario Historic Contamination", dated December 10, 2021, prepared by Tulloch.

.3 "Environmental Screening of Geotechnical Investigation Soil Samples for the Downtown Civic Plaza in Sault Ste. Marie, ON", dated February 19, 2020, prepared by Tulloch Engineering.

.2 The accuracy of the information contained in the above listed documents has not been independently verified by the *Consultant*.

END OF SECTION

Stipulated Price Bid Form

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): _____
company name

_____
street address or postal box number

_____
city/town, province and postal code

To (*Owner*): The Corporation of the City of Sault Ste. Marie
4th Floor, Civic Centre, 99 Foster Drive
Sault Ste. Marie, Ontario P6A 5X6

1.1 Bid Price

.1 We, the undersigned, having examined the *Bid Documents* and addenda numbered _____ (inclusive), and having examined the *Place of the Work*, and examined conditions thereon that affect the *Work*; hereby accept and agree to enter into a *Contract* with the *Owner* to perform the *Work* required by the *Contract Documents* for the stipulated bid price of:

$ _____ in Canadian dollars, excluding *Value Added Taxes*.
amount in figures

1.2 Declarations

.1 We understand that the *Owner* will pay the *Value Added Taxes* payable with respect to the *Contract Price* and such is not included in the bid price.

.2 We accept and agree to submit to the *Owner* required bonds and proofs of insurance specified in the conditions of the *Contract*, and as described in the *Bid Documents*, and to execute the *Contract* within 2 weeks from the date of notification of acceptance of this bid. We understand and agree that the submittal, by us, to the *Owner* of the required bonds and proofs of insurance, within 7 days after receipt of notification of conditional award, will be a condition of the final award of the *Contract* to us by the *Owner*, to the extent permitted by any other conditions contained in the notice of conditional acceptance.

.3 We undertake if our bid is accepted to commence the *Work* at the *Place of the Work*, actively, within 10 *Working Days* of the *Owner's* written authorization to commence the *Work*.

.4 We declare that no person, firm or corporation other than the undersigned has any interest in this bid or in the proposed *Contract* for which this bid is made.

.5 We propose to attain *Substantial Performance of the Work* as certified by the *Consultant* within _____ weeks from notification of conditional award of the *Contract* to the bidder by the *Owner*.

.6 We propose to attain Total Performance of the *Work* as certified by the *Consultant* within _____ weeks from notification of conditional award of the *Contract* to the bidder by the *Owner*.

.7 We accept and agree that this bid is irrevocable and may not be withdrawn by the undersigned, subject to the conditions of the *Bid Documents* pertaining to the withdrawal of bids, and is open for acceptance by the *Owner* during the *Bid Acceptance Period.*

.8 We have thoroughly examined the complete *Bid Documents*, and have visited the *Place of the Work* and carefully examined conditions affecting the *Place of the Work* and work to be done thereon, and have included in our bid price for all conditions that may affect the execution of the *Work* that are known, knowable, or reasonably inferable from such examinations, and agree and accept that no payments for extra work on account of such conditions will be allowed during the performance of the *Work*.

.9 We attach hereto a bid bond, in the form of Canadian standard construction document CCDC 220 in an amount equal to not less than 10% of our bid price. This bid bond is valid for the *Bid Acceptance Period*. The cost of this bid bond is included in our bid price.

.10 We attach hereto an agreement to bond valid for the *Bid Acceptance Period* and issued by a bonding company acceptable to *Owner* and licensed to issue such instruments in the Province of Ontario. The costs of all bonds so required are included in our bid price. This agreement to bond obliges the bonding company to issue a performance bond and a labour and material payment bond, as follows:

.1 Performance bond: CCDC 221, 100% of the bid price.

.2 Labour and material payment bond: CCDC 222, 50% of the bid price.

.11 We have included cash allowances as stipulated in the *Contract Documents*.

.12 We have completed in full and attach hereto the following bid form supplements, as supplied with the *Bid Documents*:

.1 Section 00 43 22, Unit Prices Bid Form Supplement.

.2 Section 00 43 23, Alternative Prices Bid Form Supplement.

.3 Section 00 43 36, List of Subcontractors Bid Form Supplement.

.13 We accept and agree that nothing contained in the *Bid Documents* or elsewhere, no act done or expense incurred by us in the preparation and submission of our bid, no trade or industry custom or practice, and no representation or assurance that may have been made or given to us by or on behalf of the *Owner*, shall in any manner legally bind the *Owner*, in any circumstances, to accept this bid.

.14 We accept and agree that the *Owner* shall in no event be responsible for any costs incurred by us in the preparation and submission of our bid.

1.3 Signatures

Signed and submitted by:

_____
company name

_____
name and title of authorized signing officer

_____
signature of authorized signing officer

_____
name of witness

_____
signature of witness

Dated this _____ day of _____, 20_____.

Note: Affix corporate seal as required by *Bid Documents*.

END OF SECTION

Unit Price Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): _____
company name

Signature: _____
Signature of authorized signing officer

Dated this _____ day of _____, 20_____.

Note: Affix corporate seal as required by *Bid Documents*.

We, the above named *Bidder*, offer the unit prices requested below. The amount to be added to, or deducted from, our bid price (as entered in Section 00 41 13, previously submitted) is entered for each unit price requested. All unit prices exclude *Value Added Taxes*.

We understand, agree, and accept that unit prices will be taken into account in determining the most appropriate bidder in accordance with the rules governing bid analysis given under Section 00 21 13.

Unit Price #	Description	Unit	Unit cost for additions	Unit cost for deletions
1.	Concrete Paving (35MPa concrete incl. light sandblast finish with sawcut joints)	m^2	$	
2.	Granular A (Compacted to 98% SPD, and as outlined in the specifications)	tonne	$	
3.	Granular B (Compacted to 98% SPD, and as outlined in the specifications)	tonne	$	
4.	Concrete Curb (35MPa concrete light sandblast finish with sawcut joints)	Lineal m	$	$
5.	Asphalt Paving (HL3a and HL8 layers)	m^2	$	$
6.	Reinforcing Rebar (15M to current CAN/CSA-G30.18, Grade 400)	tonne	$	$

END OF SECTION

Alternative Prices Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): _____
company name

Signature: _____
Signature of authorized signing officer

Dated this _____ day of _____, 2022.

Note: Affix corporate seal as required by *Bid Documents*.

We, the above named *Bidder*, offer the alternative prices requested below. The amount to be added to, or deducted from, our bid price (as entered in Section 00 41 13, previously submitted) is entered for each alternative requested. All alternative prices exclude *Value Added Taxes*. If there is no change to the base bid price for an alternative, we have so indicated. We understand, agree, and accept that:

(a) the *Owner* shall have the right to accept any of the alternatives and corresponding alternative prices in any order or combination, including all or none,

(b) alternative prices will be considered in determining the most appropriate *Bidder* in accordance with the rules governing bid analysis given under Section 00 21 13,

(c) alternatives and alternative prices are open for acceptance by the *Owner* for the duration of the *Bid Acceptance Period*,

(d) the *Work* of the *Contract* and the *Contract Price* will reflect the alternatives and alternative prices, if any, accepted by the *Owner* at the time of contract award, and

(e) acceptance of any alternatives will not affect the *Contract Time*, unless we have specifically indicated an increase or decrease in the *Contract Time*, in number of days, on account of a particular alternative.

Alternative Price #	Description of Alternative	Amount to be added to bid price and/or Contract Time		Amount to be deducted from bid price and/or Contract Time
1.	Supply and Install Wood Fencing in lieu of Omega UNIK Metal Fence	$ Days		$ Days
2.	Supply and Install PVC Roofing in Lieu of TPO	$ Days		$ Days

Alternative Price #	Description of Alternative	Amount to be added to bid price and/or Contract Time		Amount to be deducted from bid price and/or Contract Time
3.	Delete Maglin Movable Table and Chairs from the *Work*	$ Days		$ Days
4.	Delete Omega UNIK Metal Fence from the *Work*	$ Days		$ Days

END OF SECTION

List of Subcontractors Bid Form Supplement

Project/Contract: Project No. 2022CDE-PE-02-T
The Corporation of the Sault Ste. Marie
Downtown Plaza

From (*Bidder*): _____
company name

Signature: _____
Signature of authorized signing officer

Dated this _____ day of _____, 20_____.

Note: Affix corporate seal as required by *Bid Documents*.

Following is a list of *Subcontractors* we propose to use for the performance of the identified portions of the Work.

The UNDERSIGNED lists herein the individual *Subcontractor* and Major *Supplier* for the trades listed below and who he/she proposes to employ on the project, and upon whose sub-trade or supply quotation he/she based the Stipulated Sum quoted herein, and agrees that no change shall be made in the list, as regards such *Subcontractor* or *Supplier* actually employed on the work without the express written consent of the *Owner*.

Listed sub-contractors shall be actually engaged in the line of work required listed and shall be able to refer to work of similar nature completed by them.

Provide only ***ONE*** name per section.

Work to be performed by us is indicated by the words "BY OWN FORCES".

This bid form supplement forms part of the contract and failure on part of the contractor **to COMPLETE EACH SECTION FULLY** may result in the contractors bid being REJECTED.

We acknowledge that *Subcontractors* on this list maybe notified by the *Owner*.

List of Subcontractors

Trade/Division/Product	Subcontractor/Supplier
Excavation and Backfill	
Masonry	
Concrete Formwork	

Trade/Division/Product (cont.)	Subcontractor/Supplier (cont.)
Concrete Reinforcement	
Concrete	
Water Feature	**SOUCY Aquatik** Jonathan Gosselin jgosselin@soucyaquatik.com 418 781-0620 x 134
Refrigeration	**CIMCO Refrigeration** Tyler Ellis tellis@toromont.com 416 465-7581 x 3408
Playground	
Electrical	
Civil	
Mechanical	
Structural Steel	
Miscellaneous Metals	
Rough Carpentry	
Finish Carpentry	
Architectural Woodwork	
Roofing	
Doors and Frames	
Curtain Wall and Windows	
Door Hardware	
Gypsum Board Assemblies	
Flooring	
Painting	

Trade/Division/Product (cont.)	Subcontractor/Supplier (cont.)
Manufactured Specialties	
Rink Slab	
Plumbing	
HVAC	
Automated Controls	
Fire Alarm	
Communications	

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 *Contract Documents* conventions.

.2 *Contract Documents* for construction purposes.

.3 Law, notices, permits and fees.

.4 Documents at the *Place of the Work*.

.5 Use of premises and the *Place of the Work*.

.6 Items supplied by *Owner*.

.7 Electronic files.

1.2 *Contract Documents* Conventions

.1 The *Contract Documents* have been arranged into various divisions, sections, drawings, and schedules for the purpose of presenting the *Work* in a logical and organized form and to enable ease of reference and interpretation, and are not intended to be an arrangement of precise and independent *Subcontractors*, or jurisdiction of responsibility for the various parts of the *Work*.

.1 The *Contractor* shall be solely responsible for coordinating the execution of the *Work* of this *Contract* in accordance with the requirements of the *Contract Documents*.

.2 The *Consultant* and *Owner* shall not be required to decide on questions arising with regard to agreements or contracts between the *Contractor* and *Subcontractors* or *Suppliers*, nor to the extent of the parts of the *Work* assigned thereto, nor to establish subcontract limits between Sections or Divisions of the *Work*.

.3 No extra will be allowed as a result of the failure to coordinate and allocate the *Work* such that the *Work* is provided in accordance with the *Contract Documents*.

.2 The *Specifications* are written in the imperative mood and in streamlined form. The imperative language is directed to *Contractor*, unless stated otherwise.

.3 Complete sentences by reading "shall", "*Contractor* shall", "shall be", and similar phrases by inference. Where a colon (:) is used within sentences and phrases, read the words "shall be" by inference.

.4 Fulfill and perform all indicated requirements whether stated imperatively or otherwise.

.5 When used in the context of a *Product*, read the word “provide” to mean “supply and install to result in a complete installation ready for its intended use”.

.6 Named *Products* alternates or equals, indicated by the phrases "or approved alternate by XYZ Manufacturing" or "or approved equal by XYZ Manufacturing", shall be interpreted to mean that named *Product* alternate or equal, if selected for use in lieu of indicated or specified *Product*, meets or exceeds performance, appearance, general arrangement, dimensions, availability, code and standards compliance, and colour of specified *Product*. Be responsible for costs and modifications associated with the inclusion of named *Product* alternate or equal at no additional cost to the *Owner*.

.7 The use of the words "include" or "including", or variations thereof, within the *Contract Documents* is not limiting.

.8 The words "make good" or "making good" shall mean that, when a finish or material has been altered, the material or finish shall be repaired or replaced, and refinished to match existing quality and appearance to acceptance of *Consultant*, and that repaired or replaced and refinished *Work* shall not be discernible from existing materials or finishes when judged by the *Consultant* from a viewing distance of 1830 mm (6'), and that such work is included in the *Contract Price*.

.9 Where a component, device, item or part of materials or equipment is referred to in the singular number, such reference shall require the provision of as many components, devices, items or parts of material or equipment necessary to complete the *Work*.

.10 Reference standards:

.1 "Reference standards" means consensus standards, trade association standards, guides, and other publications expressly referenced in *Contract Documents*.

.2 Where an edition or version date is not specified, referenced standards shall be deemed to be the latest edition or revision issued by the publisher at the time of bid closing, except as follows:

.1 If a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the edition or version referenced in the applicable code or other regulatory requirement shall apply.

.3 The *Contract Documents* may specify, indicate, or schedule requirements that exceed the requirements of the building code, other applicable codes, requirements of authorities having jurisdiction, and standards cited in the *Contract Documents*. In such cases, the requirements specified, indicated, or scheduled in the *Contract Documents* shall govern.

.4 If compliance with two or more reference standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to *Consultant* for clarification.

1.3 *Contract Documents* for Construction Purposes

.1 *Owner* shall supply *Contractor* with a complete set of *Contract Documents* in electronic form before commencement of the *Work*.

1.4 Laws, Notices, Permits, and Fees

.1 The building code - Ontario Regulation 332/12, including amendments, shall govern the *Work*.

.2 Comply with codes, by-laws, and regulations of authorities having jurisdiction over the *Place of the Work*. Codes and regulations form an integral part of the *Contract Documents*.

.3 *Owner* shall apply and pay for the building permit. The *Contractor* shall pick up building permit from the municipal department having jurisdiction at the *Place of the Work*. Obtain and pay for all other permits, licenses, deposits and certificates of inspection as part of the *Work*.

.4 Arrange for inspection, testing and acceptance of the *Work* required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay costs.

.5 Obtain permits required to execute work on municipal rights of way. Obtain damage deposits for sidewalks, roads and services, unless otherwise indicated.

.6 It is the responsibility of the *Contractor* to schedule notifications and inspections required by authorities having jurisdiction such that notifications can be properly received and that inspections can be properly undertaken without causing a delay in the *Work*. The *Contractor*, at no additional cost to the *Owner*, shall be solely responsible for any delay in the *Work* caused by failure to properly schedule required notifications and inspections.

.7 The *Contractor* shall provide to the chief building official or the registered code agency, where a registered code agency is appointed under the Ontario Building Code Act in respect of the construction to which the notice relates, the required notices set out in Division C – Part 1 Sentence 1.3.5.1(2) and Sentence 1.3.5.2 of the Ontario Building Code, O. Reg. 332/12 as amended. The *Contractor* shall be present at each site inspection by an inspector or registered code agency as applicable under Division C – Part 1 Sentence 1.3.5.2 of the building code.

.1 It is the responsibility of the *Contractor* to schedule notifications to the chief building official or the registered code agency such that the inspection pertaining to the notifications can be made within the time frame as required under Division C – Part 1 Sentence 1.3.5.3 of the Ontario Building Code, O. Reg. 332/12 as amended, without causing a delay in the *Work*. The *Contractor*, at no additional cost to the *Owner*, shall be solely responsible for any delay in the *Work* caused by failure to properly schedule required notifications and inspections.

1.5 Documents at the *Place of the Work*

.1 Maintain at the *Place of the Work*, one copy of each of following:

.1 *Contract Documents* including drawings, specifications, addenda, and other modifications to the *Contract*.

.2 'Reviewed' or 'Reviewed as Noted submittals.

.3 Construction and submittal schedules.

.4 *Supplemental Instructions,* proposed *Change Orders, Change Orders,* and *Change Directives.*

.5 RFI responses and RFI log.

.6 Field test reports and independent testing reports.

.7 *Consultant's* field review reports and deficiency reports.

.8 Manufacturer's field review reports.

.9 Reports by authorities having jurisdiction.

.10 Building and other applicable permits, and related permit documents.

.11 Daily log including:

.1 Weather (precipitation, high and low temperatures, wind, and visibility).

.2 Pertinent conditions at the *Place of the Work* (muddy, flooded, frozen ground, water level).

.3 Number of workers actively working at the *Place of the Work* by each subcontract.

.4 *Subcontractors* working at the *Place of the Work*.

.5 Parts of the *Work* being worked on.

.6 Working hours worked at the *Place of the Work*.

.7 Activities with intermittent progress.

.8 Time lost and explanation for such time lost.

.9 Difficulties (work scheduled to start but did not with the reason why, delays, labour inefficiencies, labour shortage, weather).

.10 *Products* and materials delivered.

.11 Equipment mobilized and/or demobilized.

.12 Excavation conditions.

.13 Start and finish date of each part of the *Work*.

.14 Erection and removal dates of formwork.

.15 Date, quantities and particulars of each concrete pour.

.12 As-built drawings recording as-built conditions, instructions, changes for structure, equipment, wiring, plumbing, and the like, as called for in Section 01 78 00 and Divisions 21, 22, and 23 and Divisions 26, 27, and 28, prior to being concealed.

.2 Make above material available to *Consultant* upon request.

1.6 Use of Premises and the *Place of the Work*

.1 Except as otherwise specified, *Contractor* has unrestricted use of *Place of the Work* from time of *Contract* award until Ready-for-Takeover.

.2 Confine *Construction Equipment*, Temporary Work, storage of *Products*, waste products and debris, and all other construction operations to limits required by laws, ordinances, permits, and *Contract Documents*, whichever is most restrictive. Do not unreasonably encumber *Place of the Work*.

.3 Make good roads, soft landscaping, walkways, curbs, sidewalks, possessions and property, soiled or damaged due to the *Work*, to requirements of authorities having jurisdiction and requirements of *Owner*, as applicable.

.4 Fully protect adjacent site improvements, services, landscaping, and other works using suitable covering and support framing, to prevent damage by construction related activities.

1.7 Not In Contract Items and Items Supplied by Owner

.1 NIC (Not In *Contract*) shall be used to designate various items of equipment that require coordination for installation although are not provided as part of the *Work*.

.2 SBO (Supplied by *Owner*) shall be used to designate various items of equipment that will be supplied by the *Owner* for installation by the *Contractor* as part of the *Work*.

.1 *Owner* Responsibilities:

.1 Order and pay for items supplied by *Owner* not already in *Owner's* possession.

.2 Arrange and pay for delivery of items supplied by *Owner* F.O.B. the *Place of the Work*, within time frames required by *Contractor's* progress schedule. If delivered sooner than required by *Contractor's* latest progress schedule submitted to *Owner*, arrange and pay for delivery to a temporary storage location and subsequent delivery to the *Place of the Work*.

.3 Advise *Contractor* in writing of the value of items supplied by *Owner* for *Contractor's* insurance purposes.

.4 Arrange and pay for delivery to *Contractor* of reviewed *Shop Drawings*, *Product* data, samples, and manufacturer's installation instructions.

.5 Inspect deliveries jointly with *Contractor*.

.6 Submit claims for transportation damage.

.7 Arrange for replacement of damaged, defective or missing items identified at time of delivery.

.8 Arrange for manufacturer's field services.

.9 Arrange for delivery of manufacturer's warranties to *Contractor* for inclusion in operation and maintenance manual.

.2 *Contractor* Responsibilities:

.1 Designate in progress schedule, time frames for delivery of items supplied by *Owner* to the *Place of the Work* and for receipt of related submittals. If the *Place of the Work* is not ready to receive delivery of items supplied by *Owner* within the time frame indicated in the latest progress schedule submitted to *Owner*, arrange and pay for delivery to a temporary storage location and subsequent delivery to the *Place of the Work*.

.2 Review all required submittals and notify *Consultant* of any observed discrepancies or anticipated problems.

.3 Ensure that course of construction insurance is adequate to cover items supplied by *Owner*.

.4 Receive and unload items supplied by *Owner* at the *Place of the Work*.

.5 Inspect deliveries jointly with *Owner*. Record and notify *Owner* and *Consultant* of shortages and visibly damaged or defective items.

.6 Handle items supplied by *Owner* at the *Place of the Work*, including uncrating and storage. Dispose of waste materials and debris.

.7 Take appropriate precautions to protect items supplied by *Owner* from loss or damage.

.8 Repair or replace items damaged at the *Place of the Work*.

.9 Assemble, install, connect, adjust, and finish items supplied by *Owner* as specified.

.10 Arrange for inspections required by authorities having jurisdiction as specified.

.11 Arrange for or perform testing as specified.

.12 Workmanship warranty for installation.

1.8 Electronic Files

.1 In the event that the *Contractor*, a *Subcontractor*, or a *Supplier* requests AutoCAD files from the *Consultant*, the *Consultant* will be allowed to use their discretion whether or not they will provide them. The *Consultant* may charge a fee for providing the electronic files and/or require a copyright waiver to be signed, also at the *Consultant's* discretion.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Cash allowances.

1.2 Cash Allowances

.1 Expenditure of cash allowances:

.1 The *Owner*, through the *Consultant*, will provide the *Contractor* with documentation required to permit pricing of a cash allowance item.

.2 The *Owner*, through the *Consultant*, may request the *Contractor* to identify potential *Suppliers* or *Subcontractors*, as applicable, and to obtain at least three competitive prices for each cash allowance item.

.3 The *Owner*, through the *Consultant*, may request the *Contractor* to disclose originals of all bids, quotations, and other price-related information received from potential *Suppliers* or *Subcontractors*.

.4 The *Owner*, through the *Consultant*, will determine by whom each cash allowance item will be performed and for what amount. Obtain *Owner's* prior written approval in the form of a *Change Order* before entering into a subcontract, amending an existing subcontract, or before performing by own forces, work that is covered by a cash allowance. Upon issuance of the *Change Order*, the *Contractor's* responsibilities for a cash allowance item shall be the same as for other work of the *Contract*.

.2 Cash allowances are for supply and installation unless otherwise specified.

.3 Amount of each cash allowance does not include *Contractor's* overhead and profit, and other related costs, which shall be included in the *Contract Price* and not in the cash allowance.

.4 Cash allowances for supply only:

.1 Amount of each cash allowance includes:

.1 Cost of *Products* as invoiced by the *Supplier*, including delivery and applicable taxes but excluding Value Added Taxes.

.2 Amount of each cash allowance does not include costs of the following items, which costs shall be included in the *Contract Price* and not in the cash allowance:

.1 Unloading, handling and storage at the *Place of the Work*.

.2 Installation and all other related costs.

.5 Cash allowances for install only:

.1 Amount of each cash allowance includes:

.1 Unloading, storing, handling of *Products* at the *Place of the Work*.

.2 Installation, finishing, and commissioning of *Products*.

.3 Applicable taxes and duties (excluding Value Added Taxes).

.2 Amount of each cash allowance does not include costs of the following items, which costs shall be included in the *Contract Price* and not in the cash allowance:

.1 Net cost of *Products*.

.2 Delivery to the *Place of the Work*.

.6 Cash allowances for supply and install:

.1 Amount of each cash allowance includes:

.1 All costs to provide the specified *Products*, including supply, installation, and related costs, excluding Value Added Taxes.

.2 *Subcontractor's* and sub-*Subcontractor's* overheads and profits related to the cash allowance.

.7 Cash allowances for services:

.1 Amount of each cash allowance includes:

.1 All costs related to the services, excluding Value Added Taxes.

.2 *Subcontractor's* and sub-*Subcontractor's* overheads and profits related to the cash allowance.

.8 List of cash allowances

.1 The following cash allowances are included in the *Contract Price*:

.1 Independent inspection and testing per Section 01 45 00: $40,000.

.2 Supply and install of refrigeration equipment by CIMCO: $1,000,000.00.

.3 Supply and install of water feature by Soucy Aquatik: $252,400.00.

.4 Programming of the Pharos DMX controls systems by Specialty Contract: $5,000.00.

.5 Vertical Reeds by Limbic Media: $30,000.00.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 – GENERAL

1.1 Section Includes

.1 Substitution procedures.

.2 Submission requirements for proposed substitutions.

1.2 Definition

.1 In this Section "Substitution" means a *Product*, a manufacturer, or both, not originally specified in *Contract Documents* by proprietary name but proposed for use by *Contractor* in place of a *Product*, a manufacturer, or both, specified by proprietary name.

1.3 Substitution Procedures

.1 Proposals for substitutions of *Products* and materials must be submitted in accordance with procedures specified in this section.

.2 *Contractor* may propose a Substitution wherever a *Product* or manufacturer is specified by proprietary name(s), unless there is accompanying language indicating that Substitutions will not be considered.

.3 *Contractor* may propose a Substitution wherever a *Product* or manufacturer is specified by proprietary name(s) and accompanied by language such as "or equal", "or approved equal", or other similar words. Do not construe such language as an invitation to unilaterally provide a Substitution without *Consultant's* prior acceptance in writing. Do not order or install any Substitution without a *Supplemental Instruction* or *Change Order*.

.4 Provided a proposed Substitution submission includes all of the information specified in this Section under Submission Requirements For Proposed Substitutions, *Consultant* may review submissions, if directed by *Owner*, but in any case with the understanding that the *Contract Time* will not be altered due to the time required by the *Consultant* to review the submission and by the *Contractor* to implement the substitution in the *Work*.

.5 *Consultant* may recommend to *Owner* acceptance of a Substitution proposed by *Contractor* if satisfied that:

.1 The proposed substitute *Product* is the same type as, is capable of performing the same functions as, interfaces with adjacent work the same as, and meets or exceeds the standard of quality, performance and, if applicable, appearance and maintenance considerations, of the specified *Product*.

.2 The proposed substitute manufacturer has capabilities comparable to the specified manufacturer.

.3 The Substitution provides a benefit to *Owner*.

.6 If *Contractor* fails to order a specified *Product* or order a *Product* by a specified manufacturer in adequate time to meet *Contractor's* construction schedule, neither *Consultant* nor *Owner* will consider that a valid reason to accept a Substitution.

.7 If *Owner* accepts a Substitution, the change in the *Work* will be documented in the form of either a *Supplemental Instruction* or *Change Order* as specified in Section 01 26 00.

.8 If a Substitution is accepted in the form of a *Supplemental Instruction* or *Change Order*, *Contractor* shall not revert to an originally specified *Product* or manufacturer without *Consultant's* prior written acceptance.

1.4 Submission Requirements for Proposed Substitutions

.1 Include with each proposed Substitution the following information:

.1 Identification of the Substitution, including *Product* name and manufacturer's name, address, telephone numbers, and web site.

.2 Reason(s) for proposing the Substitution.

.3 A statement verifying that the Substitution will not affect the *Contract Price* and *Contract Time* or, if applicable, the amount and extent of a proposed increase or decrease in *Contract Price* and *Contract Time* on account of the Substitution.

.4 A statement verifying that the Substitution will not affect the performance or warranty of other parts of the *Work*.

.5 Manufacturer's *Product* literature for the Substitution, including material descriptions, compliance with applicable codes and reference standards, performance and test data, compatibility with contiguous materials and systems, and environmental considerations.

.6 *Product* samples as applicable.

.7 A detailed comparison of the physical properties and performance characteristics of the specified *Product* and the Substitution, with any significant variations clearly highlighted.

.8 Availability of maintenance services and sources of replacement materials and parts for the Substitution, as applicable, including associated costs and time frames.

.9 If applicable, estimated life cycle cost savings resulting from the Substitution.

.10 Details of other projects and applications where the Substitution has been used.

.11 Identification of any consequential changes in the *Work* to accommodate the Substitution and any consequential effects on the performance of the *Work* as a whole. A later claim for an increase to the *Contract Price* or *Contract Time* for other changes in the *Work* attributable to the Substitution will not be considered.

.12 Confirmation of proposed substitution delivery, in writing by *Product* manufacturer.

.13 Compliance with the building codes and requirements of authorities having jurisdiction.

.14 Copy of manufacturer's warranty for any *Product* or system for which an extended warranty has been specified, along with copy of manufacturer's warranty for specified *Product* or system with differences highlighted.

.2 Substitutions submitted on *Shop Drawings* without following requirements of this section prior to submission of the affected *Shop Drawings* will cause the *Shop Drawings* to be rejected.

.3 Proposed substitutions shall include costs associated with modifications necessary to other adjacent and connecting portions of the *Work*.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Schedule of labour rates.

.2 Method of *Contract Price* adjustment - *Change Orders*.

.3 *Change Order* procedures.

.4 Fees for overhead and profit – *Change Orders*.

.5 Method of *Contract Price* adjustment - *Change Directives*.

.6 *Change Directive* procedures.

.7 Fees for overhead and profit – *Change Directives*.

.8 *Supplemental Instructions*.

1.2 Schedule of Labour Rates

.1 Prior to the first application for payment, submit for the *Consultant's* review a schedule of labour rates for all trades and classifications of trades, such as journeymen, apprentices, and foremen that will be employed in the *Work*. Provide a breakdown of payroll burden component of labour rates.

.2 Labour rates shall reflect the salaries, wages, and benefits paid to personnel in the direct employ of the *Contractor*, *Subcontractors*, and sub-*Subcontractors*, stated as hourly rates, that will be used when:

.1 Preparing price quotations for *Change Orders*.

.2 Determining the cost of work attributable to *Change Directives*.

.3 Labour rates stated in the schedule of labour rates shall be consistent with rates that will actually be paid, and payroll burden costs that will actually be incurred, in the normal performance of the *Work*, during regular working hours. Labour rates shall not include any additional overhead and profit component.

.4 Where collective agreements apply, the labour rates shall not exceed those established by collective agreement.

.5 Obtain the *Owner's* written acceptance of the schedule of labour rates before submitting the first *Change Order* quotation.

.6 Accepted schedule of labour rates will be used solely for evaluating *Change Order* quotations and cost of performing work attributable to *Change Directives*.

.7 The *Contractor* may request amendments to the accepted schedule of labour rates if changes in the labour rates that will actually be paid, or payroll burden cost that will actually be incurred, in the normal performance of the *Work* can be demonstrated. Obtain the *Owner's* written acceptance of such changes.

1.3 Method of Contract Price Adjustment - *Change Orders*

.1 Unless otherwise agreed, the adjustment of the *Contract Price* on account of a proposed change in the *Work* shall be based on a quotation for a fixed price increase or decrease to the *Contract Price* regardless of the *Contractor's* actual expenditures and savings.

1.4 *Change Order* Procedures

.1 Upon issuance by the *Consultant* to the *Contractor* of a proposed change in the *Work*, and unless otherwise requested in the proposed change or unless otherwise agreed:

.1 Submit to the *Consultant* a fixed price quotation for the proposed change in the *Work* within 5 *Working Days* after receipt of the proposed change in the *Work*.

.2 If requested in the proposed change, provide a detailed breakdown of the price quotation including the following to the extent applicable, with appropriate supporting documentation:

.1 Estimated labour costs, including hours and applicable hourly rates based on the accepted schedule of labour rates.

.2 Estimated *Product* costs, including *Supplier* quotations, estimated quantities and unit prices.

.3 Estimated Construction Equipment costs.

.4 Enumeration of all other estimated costs included in the price quotation.

.5 Estimated credit amounts for labour and *Products* not required on account of the proposed change.

.6 Fees, not exceeding the applicable percentages for overhead and profit as specified in this Section.

.7 Where applicable, *Subcontractor* quotations, also including a detailed breakdown of all of the above.

.3 Include in the quotation the increase or decrease to the *Contract Time*, if any, for the proposed change, stated in number of days.

.4 Include in the quotation the number of days for which the quotation is valid.

.5 The quotation will be evaluated by the *Consultant* and the *Owner* and, if accepted by the *Owner*, be documented in the form of a signed *Change Order*.

1.5 Fees for Overhead and Profit – *Change Orders*

.1 Where the *Contractor's* price quotation for a *Change Order* results in a net increase to the *Contract Price*, the *Contractor's* entitlement to a fee for overhead and profit in the quotation shall be as follows, as applicable:

.1 For work to be performed by the *Contractor's* own forces, 10% of the *Contractor's* price quotation before the *Contractor's* fee is applied.

.2 price quotation before the *Contractor's* fee is applied.

.3 For work to be performed by a *Subcontractor*, 5% of the *Subcontractor's* price quotation including the *Subcontractor's* fee.

.2 Where a *Subcontractor's* price quotation for a *Change Order* results in a net increase to the Subcontractor's contract price, the *Subcontractor's* entitlement to a fee for overhead and profit in the quotation shall be as follows, as applicable:

.1 For work to be performed by the *Subcontractor's* own forces, 10% of the *Subcontractor's* price quotation before the *Subcontractor's* fee is applied.

.2 For work to be performed by a sub-*Subcontractor*, 5% of the sub-*Subcontractor's* price quotation including the sub-*Subcontractor's* fee.

.3 Where the *Contractor's* or a *Subcontractor's* price quotation for a *Change Order* results in a net decrease in price before adjustment for fees for overhead and profit, such a price quotation shall be for the net decrease without any adjustment for fees for overhead and profit.

1.6 Method of Contract Price Adjustment - *Change Directives*

.1 Unless the *Owner* and the *Contractor* reach an earlier agreement on the adjustment to the *Contract Price* by means of a *Change Order* that cancels the *Change Directive*, the adjustment in the *Contract Price* for change carried out by way of a *Change Directive* shall be determined as specified in the General Conditions of *Contract* after the change in the *Work* is completed.

1.7 *Change Directive* Procedures

.1 If a *Change Directive* is issued for a change in the *Work* for which a proposed change was previously issued, but no *Change Order* has yet been signed, the *Change Directive* shall cancel the proposed change and any *Contractor* quotations related to that change in the *Work*.

.2 When proceeding with a change in the *Work* under a *Change Directive*, keep accurate records of daily time sheets for labour and Construction Equipment, and invoices for *Product* and Construction Equipment costs. Submit such records to the *Consultant* weekly, until the *Change Order* superseding the *Change Directive* is issued.

1.8 Fees for Overhead and Profit – *Change Directives*

.1 The *Contractor's* entitlement to a fee for overhead and profit on the *Contractor's* expenditures and savings attributable to a *Change Directive* shall be as follows, as applicable:

.1 For work performed by the *Contractor's* own forces, 10% of the *Contractor's* net increase in costs.

.2 For work performed by a *Subcontractor*, 5% of the sum of the *Subcontractor's* net increase in costs plus the *Subcontractor's* fee.

.2 A *Subcontractor's* entitlement to a fee for overhead and profit on the *Subcontractor's* expenditures and savings attributable to a *Change Directives* shall be as follows, as applicable:

.1 For work performed by the *Subcontractor's* own forces, 10% of the *Subcontractor's* net increase in costs.

.2 For work performed by a Sub-*Subcontractor*, 5% of the sum of the Sub-*Subcontractor's* net increase in costs plus the Sub-*Subcontractor's* fee.

.3 Where a *Change Directive* results in net savings on account of work not required to be performed and a net decrease in the *Contractor's* or *Subcontractor's* cost, the net savings to the *Contractor* or *Subcontractor* shall be calculated without any adjustment for fees for overhead and profit.

.4 When a *Change Directive* is ultimately recorded as a *Change Order*, there shall be no additional entitlement to fees for overhead and profit beyond those specified in this article.

1.9 Supplemental Instructions

.1 The *Consultant* may issue *Supplemental Instructions* to provide clarifications to the *Contract Documents*, provide additional information, or make minor variations in the *Work* not involving adjustment in the *Contract Price* or *Contract Time*.

.2 If the *Contractor* considers a *Supplemental Instruction* to require an adjustment in *Contract Price* or *Contract Time*, the *Contractor* shall promptly notify the *Consultant* and the *Owner* in writing and shall not proceed with any work related to the *Supplemental Instruction* pending receipt of a *Change Order*, a *Change Directive*, or, in accordance with the dispute resolution provisions of the General Conditions of *Contract*, a Notice in Writing of a dispute and instructions to proceed.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Schedule of values.

.2 Cash flow projections.

.3 Workers' compensation clearance.

.4 Payment for products stored off site.

1.2 Schedule of Values

.1 Prior to the first application for payment, submit for *Consultant's* review an initial schedule of values. Modify the initial schedule of values if and as requested by *Consultant*. Obtain *Consultant's* written acceptance of the initial schedule of values prior to the first application for payment.

.2 Together with the first and all subsequent applications for payment, submit updated versions of the schedule of values to indicate the values, to the date of application for payment, of work performed and *Products* delivered to *Place of the Work.*

.3 Provide the schedule of values in an electronic spreadsheet format based on the format provided and content described in latest edition of CCDC 24 – A Guide to Model Forms and Support Documents.

.1 Identifying information including title and location of the *Work*, name of *Contractor*, number and date of application for payment, and period covered by the application for payment.

.2 A work breakdown structure based on *Contractor*, *Subcontractor*, and sub-*Subcontractor* work, systems description, Specification sections, or material and labour breakdown, as appropriate.

.3 Provisions for approved *Change Orders* and allowances, so that the breakdown amounts indicated in the schedule of values aggregate to the current total *Contract Price*. Also provide for indicating the estimated value of *Change Directives* within the schedule of values, separately from the current total *Contract Price*.

.4 Line items identifying full costs for the following:

.1 To provide mock-ups in accordance with Section 01 45 00.

.2 Progressive cleaning, specified under Section 01 74 00, as distinct from final cleaning, also specified under Section 01 74 00.

.3 Final cleaning, specified under Section 01 74 00, as distinct from progressive cleaning, also specified under Section 01 74 00.

.4 Preparation and submission of closeout submittals in accordance with the requirements of Section 01 78 00, with a value not less than 0.5% of the *Contract Price* or $10,000.00, whichever is greater.

.5 Preparation and submission of the deficiency list in accordance with the requirements of Section 01 77 00.

.5 For each item in the work breakdown structure, provide as a minimum the following information, under headings as indicated:

.1 Breakdown Amount: A dollar amount, including an appropriate pro rata portion of *Contractor's* overhead and profit.

.2 Performed to Date: The value of *Work* performed and *Products* delivered to *Place of the Work* up to the date of the application for payment, stated as a percentage of the *Contract Price* and in dollars.

.3 Previously Performed: The value of *Work* performed and *Products* delivered to the *Place of the Work* for which payment has been previously certified, stated in dollars.

.4 Current Period: The value of *Work* performed and *Products* delivered to *Place of the Work* for which *Contractor* is currently applying for payment, stated in dollars.

.5 Balance to Complete: The value of *Work* not yet performed and *Products* not yet delivered to *Place of the Work*, stated in dollars.

1.3 Cash Flow Projection

.1 Prior to the first application for payment submit, for *Consultant's* review, a forecast of approximate monthly progress payments for each month of the *Contract Time*.

.2 Submit revised cash flow forecasts monthly. Submit additional revised cash flow forecasts when there are significant changes in rate of progress of the *Work* or significant changes in the *Contract Price* as determined by the *Consultant*. Submit additional revised cash flow forecasts when requested by *Consultant*.

1.4 Workers' Compensation Clearance

.1 Submit Certificate of Clearance from the Workplace Safety and Insurance Board (WSIB) with each application for payment.

1.5 Payment for Products Stored Off Site

.1 *Owner* may, due to extraordinary circumstances and at *Owner's* sole discretion, make payments for *Products* delivered to and stored at a location other than *Place of the Work*, subject to:

.1 A request submitted by *Contractor* in writing, with appropriate justification.

.2 Whatever conditions *Owner* or *Consultant* may establish for such payments, as required to protect *Owner's* interests.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Building dimension, templates, built-ins, and coordination.

.2 Superintendent.

.3 Discrepancies and clarifications.

.4 Request for interpretation (RFI) procedures.

1.2 Building Dimension, Templates, Built-ins, and Coordination

.1 Take necessary dimensions for the proper execution of the *Work*. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

.2 Verify dimensions at the *Place of the Work* before commencing *Shop Drawings*. Before fabrication commences report discrepancies to *Consultant* in writing. Incorporate accepted variances on shop drawings and as-built records.

.3 Supply forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the *Work* and set in place or instruct separate *Subcontractors* as to their location.

.4 Supply items to be built in, as and when required together with templates, measurements, shop drawings and other related information and assistance.

.5 Pay the cost of extra work and make up time lost as a result of failure to provide necessary information and items to be built in.

.6 Verify that the *Work*, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the *Contract Documents*, and ensure that work installed in error is rectified before construction resumes.

.7 Check and verify dimensions referring to interfacing of services. Verify such dimensions with interconnected portions of the *Work*.

.8 Do not scale directly from drawings. Obtain clarification from *Consultant* if there is ambiguity or lack of information.

.9 Details and measurements of any work which is to fit or to conform with work installed shall be taken at the *Place of the Work*.

.10 Prepare and submit setting drawings, templates and other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels.

.11 *Subcontractors* shall direct related *Subcontractors* on site of specific locations required for sleeves and openings.

1.3 Superintendent

.1 Provide superintendent, and necessary supporting staff personnel who shall be in attendance at the *Place of the Work* while *Work* is being performed, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.

.2 The *Contractor* shall appoint superintendent at the *Place of the Work* who shall have overall authority at the *Place of the Work* and shall speak for the *Contractor* and represent the *Contractor's* interest and responsibilities at meetings at the *Place of the Work* and in dealings with the *Consultant* and the *Owner*.

1.4 Discrepancies and Clarifications

.1 Advise *Consultant* of discrepancies discovered in requirements of the *Contract Documents* and request clarification in written form.

.2 Advise *Consultant* when clarifications are required pertaining to meaning or intent of requirements of *Contract Documents* and request clarification from *Consultant* in written form.

.3 Do not proceed with related work until written clarification is provided by *Consultant*.

.4 Failure to notify *Consultant* shall result in *Contractor* incurring responsibility for resulting deficiencies and expense at no additional cost to the *Owner*.

.5 Written requirements issued by *Consultant* for the purpose of clarification, implicitly supersede applicable and relevant aspects of the *Contract Documents* irrespective of whether or not these documents are explicitly or specifically cited in clarification requests or clarification requirements.

1.5 Request for Interpretation - RFI

.1 A request for interpretation (RFI) is a formal process used during the *Work* to obtain an interpretation of the *Contract Documents* pursuant to GC 2.2.6 through GC 2.2.9 (inclusive).

.1 An RFI shall not constitute notice of claim for a delay.

.2 Submittal procedures:

.1 RFI form:

.1 Submit RFI on "Request for Interpretation" in form acceptable to the *Consultant*, an example of which is appended to this section. The *Consultant* shall not respond to an RFI except as submitted on this form.

.2 Where RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required.

.3 Submit with RFI form necessary supporting documentation.

.2 Submit RFI form as follows:

.1 1 copy digitally in pdf format to *Consultant* using the *Consultant's* document management system.

.1 Refer to Section 01 11 00 "Electronic Files" paragraph.

.2 Submit RFIs sufficiently in advance of affected parts of the *Work* so as not to cause delay in the performance of the *Work*. Costs resulting from failure to do this will not be paid by the *Owner*.

.3 RFIs shall be submitted only to the *Consultant*.

.4 RFIs shall be submitted only by *Contractor*. RFIs submitted by *Subcontractors* or *Suppliers* shall not be accepted.

.5 Number RFIs consecutively in one sequence in order submitted.

.6 Submit one distinct RFI per RFI form.

.3 RFI log:

.1 Maintain log of RFIs sent to and responses received from the *Consultant*, complete with corresponding dates.

.2 Submit updated log of RFIs with each progress draw submittal.

.4 *Consultant* shall review RFIs from the *Contractor* submitted in accordance with this section, with the following understandings:

.1 *Consultant's* response shall not be considered as a *Change Order* or *Change Directive*, nor does it authorize changes in the *Contract Price* or *Contract Time* or changes in the *Work*.

.2 Only the *Consultant* shall respond to RFIs. Responses to RFIs received from entities other than the *Consultant* shall not be considered.

.5 Allow 5 *Working Days* for review of each RFI by the *Consultant*.

.1 *Consultant's* review of RFI commences on date of receipt by the *Consultant* of RFI submittal and extends to date RFI returned by *Consultant*.

.2 When the RFI submittal is received by *Consultant* before noon, review period commences that day; when RFI submittal is received by *Consultant* after noon, review period begins on the next *Working Day*.

.3 If, at any time, the *Contractor* submits a large enough number of RFIs such that the *Consultant* cannot process these RFIs within 5 *Working Days*, the *Consultant*, will confer with the *Contractor* within 1 *Working Day* of receipt of such RFIs, and the *Consultant* and the *Contractor* will jointly prepare an estimate of the time necessary for processing same as well as an order of priority between the RFIs submitted. The *Contractor* shall accommodate such necessary time at no increase in the *Contract Time* and at no additional cost to the *Owner*.

.6 Undertake a review of the *Contract Documents* to determine that the matter in question relating to the interpretation of the *Contract Documents* cannot be resolved by direct reference to the *Contract Documents*. Describe this review in detail on the RFI form. RFI submittals that lack a detailed review description, or where the detail provided is insufficient, in the sole opinion of the *Consultant*, shall not be reviewed by the *Consultant* and shall be rejected.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

Contractor's Request for Interpretation

Consultant's Supplemental Instructions

Date	# of Pages
To	From
Co.	Co.
Phone #	Phone #
Fax #	Fax #
Email	Email

Project: _____ RFI No.: _____

Owner: _____ Date of Request: _____

To: _____ *Contractor*: _____

(*Consultant's* Representative)

Project No.: _____ *Contractor's* Representative: _____

Consultant's Fax No.: _____ Fax No.: _____

Interpretation Requested: (Description of request for interpretation and references to relevant portions of *Contract Documents*)

Attachments: _____

Requested by: _____

Consultant's Supplemental Instruction:

Attachments: _____

Reply By: _____

The work shall be carried out in accordance with these *Supplemental Instructions* issued in accordance with the *Contract Documents* without change in *Contract Price* or *Contract Time*. Prior to proceeding with these instructions, indicate acceptance of these instructions as being consistent with the *Contract Documents* by returning a signed copy to the *Consultant*.

Supplemental Instruction Issued: *Supplemental Instruction* Accepted:

By: _____ By: _____

Consultant Date *Contractor* Date

Cc: ☐ *Owner* ☐ *Consultant* ☐ Contractor ☐ Field ☐ Other:

PART 1 - GENERAL

1.1 Section Includes

.1 Project meeting requirements.

1.2 Administrative

.1 The *Contractor* shall schedule meetings as specified herein.

.1 Such scheduling shall be in consultation both with the *Owner* and with the *Consultant*.

.2 The *Contractor* shall prepare agendas for meetings specified herein.

.1 Agendas shall include, as a minimum, the agenda items specified in the *Contract Documents*.

.3 The *Contractor* shall distribute written notice of each meeting specified herein, complete with meeting agenda, 5 *Working Days* in advance of meeting date to the *Consultant* and the *Owner* and other affected parties.

.4 The *Contractor* shall chair and record the minutes of meetings specified herein.

.1 *Contractor* shall distribute copies of minutes to the *Owner*, the *Consultant*, and all others in attendance within 3 *Working Days* after date of meeting.

.5 Representatives of parties attending meetings shall be authorized to act on behalf of the parties they represent.

.6 *Subcontractors* and *Suppliers* shall attend meetings only when directed by the *Consultant*, or when specifically called for in the *Contract Documents*.

.7 The *Contractor* shall prepare, and distribute to the *Consultant* and the *Owner* 4 days in advance of next progress meeting date, the following:

.1 Monthly progress reports containing updated construction schedule, submittal logs, requests for interpretation logs, and budget.

1.3 *Contract* Start-Up Meeting

.1 Within 5 days after award of *Contract*, request a meeting of parties in *Contract* to discuss and resolve administrative procedures and responsibilities prior to the commencement of the *Work*.

.2 Attendees at *Contract* start-up meeting shall include the following:

.1 *Contractor*.

.2 *Contractor's* site superintendent(s).

.3 *Consultant*.

.4 *Owner*.

.5 Independent inspection and testing company.

.3 Agenda to include the following:

.1 Appointment of official representative of participants in the *Project*.

.2 Status of permits, fees and requirement of authorities having jurisdiction. Action required.

.3 Establishing a schedule for progress meetings.

.4 Requirements for *Contract* modification and interpretation procedures, including, but not limited to: requests for interpretation, contemplated change orders, *Change Orders*, *Change Directives*, *Supplemental Instructions*, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.5 Submittal requirements and procedures.

.6 Schedule of submission of samples, colour chips, and items for *Owner's* and/or *Consultant's* consideration.

.7 Construction schedule and progress scheduling.

.8 Delivery schedule of specified equipment.

.9 Appointment of independent inspection and testing agencies or firms.

.10 Requirements for notification for reviews. Allow a minimum of 48 hours' notice to *Consultant* for review of the *Work*.

.11 Requirements for Temporary Work.

.12 Requirements for firestopping coordination and preparation of firestopping manual (refer to Section 01 33 00).

.13 Security requirements at and for the *Place of the Work*.

.14 *Owner* supplied *Products*.

.15 Review of waste management and disposal procedures and requirements.

.16 As-built documents.

.17 Operation and maintenance manuals.

.18 Take-over procedures, acceptance, warranties.

.19 Publication to be used for publishing certificate of substantial performance.

.20 Progress claims, administrative procedures, holdbacks.

.21 Insurances, transcripts of policies.

.22 *Contractor's* safety procedures.

.23 Cleaning area for vehicles.

.24 Certificate of Clearance from the Workplace Safety and Insurance Board (WSIB).

1.4 Pre-Installation Meetings

.1 During the course of the *Work* prior to *Substantial Performance of the Work*, schedule pre-installation meetings as required by the *Contract Documents* and coordinated with the *Consultant*.

.2 As far as possible, pre-installation meetings shall be scheduled to take place on the same day as regularly scheduled progress meetings.

.3 Attendees at pre-installation meetings shall include the following:

.1 *Contractor*.

.2 *Subcontractors* affected by the work for which the pre-installation meeting is being conducted.

.3 *Consultant*.

.4 Manufacturer's representatives, as applicable.

.5 Independent inspection and testing company, as applicable.

.4 Agenda to include the following:

.1 Appointment of official representatives of participants in the *Project*.

.2 Review of existing conditions and affected work, and testing thereof as required.

.3 Review of installation procedures and requirements.

.4 Review of environmental and site condition requirements.

.5 Schedule of the applicable portions of the *Work*.

.6 Schedule of submission of submittals, samples, mock-ups, and items for *Consultant's* consideration.

.7 Requirements for Temporary Work.

.8 Requirements for notification for reviews. Allow a minimum of 48 hours' notice to *Consultant* for review of the *Work*.

.9 Requirements for inspections and tests, as applicable. Schedule and undertake inspections and tests.

.10 Delivery schedule of specified equipment.

.11 Special safety requirements and procedures.

.12 Publication to be used for publishing certificate of substantial performance.

1.5 Progress Meetings

.1 During the course of the *Work* prior to *Substantial Performance of the Work*, schedule regular progress meetings to occur monthly.

.2 Attendees at progress meetings shall include the following:

.1 *Contractor*.

.2 *Contractor's* site superintendent(s).

.3 *Consultant*.

.4 *Owner*.

.3 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Review of items arising from proceedings.

.3 Review of progress of the *Work* since previous meeting and *Contractor's* monthly progress report.

.4 Field observations, problems, conflicts.

.5 Update construction schedule.

.6 Problems that impede compliance with construction schedule.

.7 Review of off-site fabrication delivery schedules.

.8 Review material delivery dates/schedule.

.9 Corrective measures and procedures to regain construction schedule.

.10 Revisions to construction schedule.

.11 Progress, schedule, during subsequent period of the *Work*.

.12 Review submittal schedules.

.13 Review status of submittals.

.14 Maintenance of quality standards.

.15 Pending changes and substitutions.

.16 Review of *Contract* modifications and interpretations including, but not limited to: requests for interpretation and log, contemplated change orders, *Change Orders*, *Change Directives*, and *Supplemental Instructions* for effect on construction schedule and on *Contract Time*.

.17 Review of status of as-built documents.

.18 Other business.

1.6 Pre-Takeover Meeting

.1 30 days prior to application for *Substantial Performance of the Work*, schedule a pre-takeover meeting.

.2 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Review of items arising from proceedings.

.3 Review of procedures for *Substantial Performance of the Work*, completion of the *Contract*, and handover of the *Work*.

.4 Field observations, problems, conflicts.

.5 Review of outstanding *Contract* modifications and interpretations including, but not limited to: requests for interpretation and log, contemplated change orders, *Change Orders*, *Change Directives*, and *Supplemental Instructions* for effect on construction schedule and on *Contract Time*.

.6 Problems which impede *Substantial Performance of the Work*.

.7 Review of procedures for deficiency review. Corrective measures required.

.8 Review of arrangements for hydro, heating, and other services.

.9 Progress, schedule, during succeeding period of the *Work*.

.10 Review submittal requirements for warranties, manuals, and all demonstrations and documentation required for *Substantial Performance of the Work*.

.11 Review of keying and hardware requirements.

.12 Review of status of as-built documents and record drawings.

.13 Status of commissioning and training.

.14 Review *Contractor's* deficiency list and status.

.15 Cleaning for occupancy.

.16 Other business.

1.7 Post-Construction Meeting

.1 Prior to application for completion of *Contract*, schedule a post-construction meeting. 5 *Working Days* prior to date for meeting, *Consultant* shall confirm a date for meeting based on evaluation of completion requirements.

.2 Agenda to include the following:

.1 Review, approval of proceedings of previous meeting.

.2 Confirmation that no business is arising from proceedings.

.3 Confirmation of completion of the *Contract*, and handover of reviewed documentation from the *Consultant* to the *Owner*.

.4 Confirmation of completion of contemplated change orders, *Change Orders*, *Change Directives*, and *Supplemental Instructions*.

.5 Problems that impede *Contract* completion.

.6 Identify unresolved issues or potential warranty problems.

.7 Confirmation of completion of deficiencies.

.8 Corrective measures required.

.9 Confirmation of arrangements for hydro, heating and other services.

.10 Confirm submittal requirements for warranties, manuals, and demonstrations and documentation for *Contract* completion are in order.

.11 Review of procedures for communication during post-construction period.

.12 Handover of reviewed record documents by the *Contractor* to the *Owner*.

.13 Submission of final application for payment.

.14 Review and finalize outstanding claims, pricing, and allowance amounts.

.15 Status of commissioning and training.

.16 Demobilization and the *Place of the Work* restoration.

.17 Review of requests for interpretation log.

.18 Other business.

1.8 Special Meetings

.1 *Owner* and/or *Consultant* reserves the right to require special meetings which may be held on short notice and at which attendance by *Contractor* and representatives of affected *Subcontractors* and *Suppliers* is mandatory. *Contractor* shall keep detailed and accurate meeting notes and distribute copies within 3 *Working Days* to all in attendance and those affected by agreements made at such meetings.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section includes

.1 Construction progress schedule.

.2 Submittals schedule.

.3 Inspection and testing schedule.

.4 Recording actual site conditions on as-built documents.

.5 Schedule management.

.6 Digital photographs.

.7 Digital video recordings.

1.2 Summary

.1 This Section specifies *Contractor's* responsibilities for preparation and submission of schedules and other documentation related to tracking construction progress.

.2 The schedule shall:

.1 Show actual progress versus planned progress.

.2 Demonstrate that scheduling issues are being proactively identified and addressed in a timely manner, and that planned progress is being maintained as closely as possible.

1.3 Schedule Format

.1 Prepare schedules in the form of a Gantt chart method.

.2 Include horizontal time scale identifying the first *Working Day* of each week.

.3 Include a separate bar for each trade, work package, or operation.

.4 Format for listings: The chronological order of the start of each item or part of the *Work*.

.5 Identification of listings: By systems description.

.6 Upon request by the *Consultant*, submit a digital copy of the construction schedule to the *Consultant*. The digital copy shall be in a native file type that permits modification of the data. In case of discrepancy between a digital-copy of the construction schedule and the corresponding hard-copy of the construction schedule, the hard-copy of the construction schedule bearing the latest date, and that has been formally submitted and reviewed in accordance with the requirements of Section 01 32 00 shall govern.

1.4 Construction Progress Schedule

.1 Format and content:

.1 Include the complete sequence of construction activities, including provision for climate and weather.

.2 Provide a work breakdown structure identifying key activities, work packages, and major milestones at a sufficient level of detail to effectively manage construction progress, including:

.1 Long delivery *Products*.

.2 Dates for the commencement and completion of inspection and testing.

.3 Preparation and review of mock-ups.

.4 *Owner* decisions for cash allowances.

.5 Shutdown or closure activities.

.6 Delivery of items supplied by *Owner*.

.7 *Owner* performed work.

.8 Demonstration and training activities.

.9 Dates for the commencement and completion of each major element of the *Work* parallel to the sections of the specifications.

.10 Dates for Ready-for-Takeover and *Substantial Performance of the Work*.

.11 Dates for delivery of *Products*, equipment, finish items, factory-finished manufactured items. Show last dates for order, shipment, and delivery in order to meet construction schedule.

.3 Show projected percentage of completion for each item as of the first *Working Day* of each week.

.2 Submission:

.1 Submit initial schedule to *Owner* and *Consultant* within 10 *Working Days* after *Contract* award.

.2 Submit schedule in pdf format to *Consultant* using the *Consultant's* document management system.

.3 *Consultant* will review format and content of initial schedule and request necessary changes, if any, within 10 *Working Days* after receipt.

.4 If changes are required, resubmit finalized initial schedule within 5 *Working Days* after return of review copy.

.5 Submit updated progress schedule to *Owner* and *Consultant* with each application for progress payment, indicating actual and projected start and finish dates with report date line and progress. Submit more frequently if requested by *Owner* or *Consultant*.

.6 At each date of submission of schedule, indicate progress of each activity.

.1 Show changes occurring since previous submission of the construction schedule:

.1 Major changes in scope.

.2 *Change Orders* and *Change Directives*.

.3 Activities modified since previous submission.

.4 Revised projections of progress and completion.

.5 Other identifiable changes.

.2 Include a narrative report to define:

.1 Problem areas, anticipated delays, and the impact on the schedule.

.2 Corrective action recommended and its impact on the schedule.

.3 Include cash flow projection with minimum look ahead as directed by the *Consultant*.

1.5 Submittals Schedule

.1 Format and content:

.1 Prepare a detailed schedule of submittals required by the *Contract Documents*, including samples required for testing, and including those for items supplied by *Owner*.

.2 Provide a separate line for each required submittal, organized by *Specifications* section names and numbers, and further broken down by individual *Products* and systems as required.

.3 Indicate dates for submitting, review time, resubmission time, float time, and last date for meeting construction schedule.

.4 Schedule submissions of submittals well in advance of scheduled dates for installation, to provide lead time for reviews and possible resubmissions and for placing orders and securing delivery so as to avoid delays in the *Work*.

.5 Make provisions in schedule for at least 10 *Working Days* for *Consultant's* review of submittals. When submittals have to be reviewed by one or more of *Consultant's* subconsultants, add 5 more *Working Days* for a total 15 *Working Days* review period.

.6 If the *Consultant* requires resubmission of submittals, allow for an additional 10 *Working Days* review for each resubmission.

.7 If, at any time, the *Contractor* submits a large enough number of submittals such that the *Consultant* cannot process these submittals within 10 *Working Days*, the *Consultant*, in consultation with the *Contractor* within 3 *Working Days* of receipt of such submittal, will provide the *Contractor* with an estimate of the time necessary for processing same. The *Contractor* shall accommodate such necessary time at no increase in the *Contract Time* and at no additional cost to the *Owner*.

.8 Changes in the construction schedule shall maintain the minimum review periods for the *Consultant's* review specified above.

.2 Submission:

.1 Submit initial schedule to *Consultant* within 15 *Working Days* after *Contract* award.

.2 Submit schedule in pdf format to *Consultant* using the *Consultant's* document management system.

.3 *Consultant* will review format and content of initial schedule and request necessary changes, if any, within 10 *Working Days* after receipt.

.4 *Consultant* will review submittal schedule and advise *Contractor* if volume and timing of submittals will permit review of and response to submittals within timeframes specified under Section 01 32 00. *Consultant* may require modifications to submittals schedule in order to allow adequate time for review of submittals. Adjust submittals schedule and construction schedule as required to comply with *Consultant's* needs.

.5 If changes are required, resubmit finalized schedule within 5 *Working Days* after return of review copy.

.6 Submit updated submittals schedule monthly to the *Consultant* or more frequently as directed by the *Consultant*.

.7 Schedule shall be accompanied by a checklist, correlated to each of the schedule of submittals, the construction schedule, and the schedule of inspections and tests, listing the following:

.1 *Shop Drawings*.

.2 Samples.

.3 Mock-ups.

.4 Reviews, tests and inspections by:

.1 Manufacturers.

.2 Authorities having jurisdiction.

.3 The *Owner*.

.4 The *Consultant*.

.5 Independent inspection and testing companies.

.5 Demonstration and training.

1.6 Inspection and Testing Schedule

.1 Prepare schedule for inspection and testing by advance discussion with the selected independent inspection and testing company to determine the time required for the independent inspection and testing company to perform its tests and to issue each of its findings, and allow for required time in the construction schedule.

.2 Refer to Section 01 45 00 for additional requirements for inspection and testing scheduling.

1.7 Schedule Management

.1 A schedule submitted as specified and accepted by *Consultant* shall become the baseline schedule and shall be used as the baseline for updates.

.2 At each regular progress meeting, review and discuss current construction progress and submittals schedules with *Consultant* and *Owner*, including activities that are behind schedule and planned measures to regain schedule slippage in key areas on or near the critical path.

.3 Activities considered behind schedule are those with start or completion dates later than the dates shown on the baseline schedule.

1.8 Recording Actual Site Conditions on As-Built Documents

.1 *Owner* will provide 1 set of *Contract Documents* to the *Contractor* for as-built documentation purposes. Record information and maintain as-built documents in clean, dry and legible condition.

.2 Clearly label each drawing as "AS-BUILT DRAWING" and each specification "AS-BUILT SPECIFICATION" and each schedule "AS-BUILT SCHEDULE". Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.3 Accurately document as-built conditions and deviations from *Contract Documents* as the *Work* progresses.

.4 Mark changes in red ink.

.5 Document actual construction including:

.1 Survey of as-built conditions and survey logs prepared by the registered land surveyor responsible for setting out the work and field engineering.

.2 Depths of various elements of foundation in relation to survey datum.

.3 Horizontal and vertical location of utilities and appurtenances referenced to permanent surface improvement.

.4 Other underground installations and services set beneath slabs-on-grade referenced to visible and accessible features of structure.

.5 'As-built' elevations of paving, sidewalks, manholes and catchbasins.

.6 Field changes of dimensions/details.

.7 Changes by *Change Orders*, *Change Directives*, and *Supplemental Instructions*.

.8 References to *Shop Drawings*, where *Shop Drawings* show more detail.

.9 Locations of interior mechanical and electrical equipment and distribution.

.10 Elevations and location depths of services. Identify type and size of service and materials used.

.11 In specification as-builts: Document as-built *Products*, including manufacturer, manufacturer's model or system number.

.6 Do not use as-built drawings for construction purposes.

1.9 Digital Photographs

.1 Provide photographic documentation in digital format and in accordance with procedures and submission requirements specified in this section.

.2 Equipment: Provide photographs using minimum 10 megapixel digital camera.

.3 Submit the required photographs to the *Consultant* and to the *Owner*.

.4 Output: Supply date stamped maximum resolution colour photos to *Consultant* in JPEG format, on CD-ROM format.

.5 Number of photos required:

.1 Prior to construction: Provide necessary number of photographs, as required to document existing conditions and verify damage to adjacent streets and property that may have existed prior to construction or demolition work: Minimum 50 photos.

.2 Each Progress draw: Provide 24 construction photographs each month to accompany each application for progress draw to document the stage of the *Work* from points selected by the *Consultant* showing as much as possible of the *Work* installed during the previous month.

.3 Provide minimum of 8 photographs on each meeting report and for each progress meeting.

.4 Completion: When the *Work* is completed, arrange to take final photographs of the *Work* from a minimum of 8 points of view.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Administrative requirements.

.2 Submission procedures.

.3 Certificates and Certification Submittals.

.4 *Product* data sheets.

.5 *Shop Drawings*.

.6 Engineered Judgements.

.7 Project firestopping manual and coordination.

.8 Samples.

1.2 Administrative Requirements

.1 Submit submittals as requested by the *Contract Documents*, as specified herein, and in accordance with the submittals schedule prepared in accordance with Section 01 32 00.

.2 In addition to submittals specifically requested by the *Contract Documents*, submit other submittals as may be reasonably requested by the *Consultant*, or as are required to coordinate the *Work* and to provide the *Owner* with choices available, within the scope of *Contract Documents*.

.3 Where required by authorities having jurisdiction, provide submittals to such authorities for review and approval.

.4 Make submittals with reasonable promptness and in an orderly sequence so as to cause no delay in the *Work*. Be solely responsible for delays, make up time lost, and pay added costs incurred because of not making submittals in due time to permit proper review by *Consultant*.

.5 Once submitted, a submittal shall not be re-submitted until original submission has been reviewed by *Consultant* and returned to *Contractor*.

.6 Submittals that contain substitutions will be rejected. Substitutions are permitted only in accordance with Section 01 25 00.

.7 Do not proceed with work affected by a submittal, including ordering of *Products*, until relevant submittal has been reviewed by *Consultant*.

.8 Prepare submittals using SI (metric) units.

.9 *Contractor's* responsibility for deviations in submittal from requirements of *Contract Documents* is not relieved by *Consultant's* review of submittal, unless *Consultant* gives written acceptance of specific deviations.

.10 Keep copies of reviewed submittals at the *Place of the Work* in an organized condition. Only submittals that have been reviewed by the *Consultant* and are marked with *Consultant's* review stamp, as applicable, are permitted at the *Place of the Work*.

.11 The *Work* shall conform to reviewed submittals subject to the requirements of this section. Remove and replace materials or assemblies not matching reviewed submittals at no increase in the *Contract Time* and at no additional cost to the *Owner*.

.12 *Contractor's* review of submittals:

.1 Review submittals for conformity to *Contract Documents* before submitting to *Consultant*. Submittals shall bear stamp of *Contractor* and signature of a responsible official in *Contractor's* organization indicating in writing that such submittals have been checked and coordinated by *Contractor*. Review shall be performed by qualified personnel who have detailed understanding of those elements being reviewed and of the conditions at the *Place of the Work* proposed for installation.

.2 Check and sign each submittal and make notations considered necessary before submitting to *Consultant* for review. Where submittal is substantially and obviously in conflict with requirements of *Contract Documents*, reject submittal without submitting to *Consultant* and request resubmission. Note limited number of reviews of each submittal covered under *Consultant's* services as specified below.

.3 Assume sole responsibility for any conflicts occurring in the *Work* that result from lack of comparison and coordination of submittals required for the *Work*.

.4 Assume sole responsibility for dimensions to be confirmed and correlated at the *Place of the Work* for information that pertains to fabrication processes or to techniques of construction and installation, and for coordination of the *Work*.

.5 Submittals that have not been reviewed, checked, and coordinated by *Contractor* prior to submission to *Consultant*, or that do not bear the stamp and signature of *Contractor* as described above, will be stamped "REVISE AND RESUBMIT" and returned.

.6 Notify *Consultant* in writing of changes made on submittals from *Contract Documents*. *Consultant's* review of submittals shall not relieve *Contractor* of responsibility for changes made from *Contract Documents* not covered by written notification to *Consultant*.

.13 *Consultant's* review of submittals:

.1 Review of submittals by *Consultant* is for the sole purpose of ascertaining conformance with the general design concepts and the general intent of the *Contract Documents*. This review shall not mean that *Consultant* approves the detail design inherent in the submittals, responsibility for which shall remain with the *Contractor*. Such review shall not relieve the *Contractor* of responsibility for errors or omissions in the submittals, nor of responsibility for meeting requirements of *Contract Documents*.

.2 As part of their scope of work, *Consultant* shall review *Shop Drawings* no more than twice. Should three or more reviews be required due to reasons of *Contractor* omissions causing resubmission requests, then *Contractor* shall reimburse the *Consultant* for time expended in these extra reviews. Time shall be invoiced to the *Owner* (to be deducted from monies due to the *Contractor* and paid to *Consultant* by *Owner*) at rates recommended by *Consultant's* professional association and disbursements shall be invoiced at *Consultant's* cost. The *Contractor* shall cover directly costs and administration associated with courier services and the like for these extra *Shop Drawings* reviews.

.3 *Consultant's* review and markings on submittals do not authorize changes in the *Work* nor in the *Contract Time*, and shall be accommodated at no additional cost to the *Owner*. If, in the opinion of the *Contractor*, the *Consultant's* markings on submittals constitute a change in the *Work* or will effect a change in the *Contract Time*, then the *Contractor* shall so notify the *Consultant* in writing and request an interpretation following the procedures for requests for interpretation in accordance with Section 01 31 00. If the *Consultant* finds that the *Consultant's* markings on submittals do constitute a change in the *Work* or will effect a change in the *Contract Time*, then a *Change Order* will be prepared therefore. The time taken to process such a request for interpretation shall not, in and of itself, constitute a change in the *Work* nor an increase the *Contract Time*.

.4 Submittals that are not required by the *Contract Documents* or not requested by the *Consultant* will not be reviewed by the *Consultant* and will be marked 'NOT REVIEWED' by the *Consultant* and returned to the *Contractor*.

.14 Engineered submittals:

.1 Submittals for items required to be sealed by professional engineer (engineered) shall be duly prepared, sealed, and signed under the direct control and supervision of a qualified professional engineer licensed in the jurisdiction in which the *Place of the Work* is located, having in force professional liability insurance with minimum coverage limit of $2,000,000 per claim and annual aggregate.

.2 Include with engineered submittal, proof of insurance identifying insurer, policy number, policy term, and limit of liability, on duly signed letterhead and / or certificates of insurance.

.3 Design includes life safety, sizing of supports, anchors, framing, connections, spans, and as additionally required to meet or exceed requirements of applicable codes, standards, regulations, authorities having jurisdiction, and design requirements of the *Contract Documents*.

.4 Engineered submittals shall include design calculations, complete with references to codes and standards used in such calculations, supporting the proposed design represented by the submittal.

.5 Professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review, including review of associated mock-ups where applicable, at locations wherever the work as described by the engineered submittal is in progress, during fabrication and installation of such work, and shall submit a field review report after each visit. Field review reports shall be submitted to the *Consultant*, to authorities having jurisdiction as required, and in accordance with the building code.

.6 Field reviews shall be at intervals as necessary and appropriate to the progress of the work described by the submittal to allow the engineer to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the *Contract Documents*, including reviewed shop drawings and design calculations.

.7 Upon completion of the parts of the *Work* covered by the engineered submittal, the professional engineer responsible for the preparation of the engineered submittal and for undertaking the periodic field reviews described above, shall prepare and submit to the *Consultant* and authorities having jurisdiction, as required, a letter of general conformity for those parts of the *Work*, certifying that they have been provided in accordance with the requirements both of the *Contract Documents* and of the authorities having jurisdiction over the *Place of the Work*.

.8 Costs for such field reviews and field review reports and letters of general conformity are included in the *Contract Price*.

1.3 Submission Procedures

.1 Coordinate each submittal with requirements of the *Work* and *Contract Documents*. Individual submittals shall include related information.

.2 Distribute copies of submittals to parties whose work is affected by submittals except *Consultant* and *Owner* before final submission for review by *Consultant*.

.3 Accompany submittals with transmittal letter containing:

.1 Date.

.2 *Project* title and number.

.3 *Contractor's* name and address.

.4 *Contractor's* review stamp.

.5 Identification and quantity of each submittal.

.6 Other pertinent data.

.4 Each submittal shall be identified numerically by relevant *Specifications* section number with a numeric indicator for multiple submittals by that section followed by revisions number, for example 04 05 19-01-R0.

.5 Submit original PDF documents only: scanned documents shall not be accepted.

.6 Make any changes in submittal that *Consultant* may require, consistent with *Contract Documents*, and resubmit as directed by *Consultant*.

.7 Notify *Consultant*, in writing, when resubmitting, of any revisions other than those requested by *Consultant*.

.8 After *Consultant's* review, distribute copies to affected parties.

1.4 Certificates and Certification Submittals

.1 Certificates and certifications submittals: Provide a statement that includes signature of entity responsible for preparing certification.

1.5 *Product* Data Sheets

.1 Submit *Product* data sheets as hard copy prints; 1 set for *Consultant*, 1 set each of applicable structural, mechanical and electrical engineers.

.2 Submit *Product* data sheets as follows:

.1 1 copy digitally in pdf format to *Consultant* using the *Consultant's* document management system.

.3 Submit *Product* data sheets as called-for by the *Contract Documents* or as the *Consultant* may reasonably request where shop drawings will not be prepared due to a standardized manufacture of a *Product*. Manufacturers' catalogue cuts will be acceptable in such cases, providing that they are 213 mm x 275 mm (8-1/2" x 11") originals, and that they indicate choices including sizes, colours, model numbers, options and other pertinent data, including installation instructions. Submissions showing only general information are not acceptable.

.4 Where requirements of *Contract Documents* are more stringent than design proposed on *Product* data sheets, the requirements of the *Contract Documents* take priority.

.5 Upon completion of review by *Consultant*, 1 marked set of *Product* data sheets will be returned to *Contractor* in digital format for reproduction and distribution.

.6 Retain 1 complete set of reviewed *Product* data sheets for issuance as part of closeout submittals in accordance with Section 01 78 00.

1.6 Shop Drawings

.1 Submit *Shop Drawings* as follows:

.1 1 copy digitally in pdf format to *Consultant* using the *Consultant's* document management system.

.2 Lettering on *Shop Drawings* shall be not less than 3 mm (1/8") high.

.3 Reproduction of construction *Drawings* to serve as background for *Shop Drawings* is not permitted.

.4 Where requirements of *Contract Documents* are more stringent than design proposed on *Shop Drawings*, the requirements of the *Contract Documents* take priority.

.5 *Consultant* markings and resulting action required:

.1 *Shop Drawings* requiring no changes will be marked 'REVIEWED', and shall be submitted for as-built drawings purposes.

.2 *Shop Drawings* requiring several changes will be marked 'REVIEWED as NOTED' and shall be revised and submitted for as-built drawings purposes.

.3 *Shop Drawings* requiring substantial changes will be marked 'REVISE AND RE-SUBMIT' and shall be revised and resubmitted until *Consultant* stamps *Drawings* with 'REVIEWED' or 'REVIEWED as NOTED'.

.6 *Shop Drawings* size shall be multiple of 213 mm and 275 mm (8-1/2" and 11") excluding 38 mm (1-1/2") binding margin and not larger than 838 mm x 1117 mm (33" x 44"). Leave minimum 150 mm x100 mm (6" x 4") clear space for *Consultant's* comments.

.7 Upon completion of review by *Consultant*, 1 marked set of *Shop Drawings* will be returned to *Contractor* in digital format for reproduction and distribution.

.8 Retain 1 complete set of reviewed *Shop Drawings* for issuance as part of closeout submittals in accordance with Section 01 78 00.

.9 Submit copies of reviewed *Shop Drawings* to authorities having jurisdiction as required.

.10 *Shop Drawings* shall include:

.1 Fabrication and erection dimensions.

.2 Plans, sections, elevations, arrangements and sufficient full size details which indicate complete construction, components, methods of assembly as well as interconnections with other parts of the *Work*.

.3 Design calculations for items that require design calculations.

.4 Clear definition of the division of responsibility for the work described thereon. No *Products*, items or equipment, or description of work, shall be indicated to be supplied, or work to be done, "By Others" or "By Purchaser". *Shop Drawings* marked with either of these phrases shall be rejected without having been reviewed by the *Consultant*.

.5 Location and type of exposed anchors, attachments and locations and types of fasteners, including concealed reinforcements to accept mounted fasteners.

.6 Adhesives, joinery methods and bonding agents.

.7 Kinds and grades of materials, their characteristics relative to their purpose, detailed description of finishes and other fabrication information.

.8 Configurations, types and sizes required; identify each unit type on drawing and on *Product*.

.9 Descriptive names of equipment and mechanical and electrical characteristics when applicable.

.10 Data verifying that superimposed loads will not affect function, appearance and safety or work shown on shop drawings, as well as other interconnected work.

.11 Assumed design loadings, dimensions of elements and material *Specifications* for load-bearing members.

.12 Proposed chases, sleeves, cuts and holes in structural members.

.13 Wall thicknesses of metals.

.14 Location and types of welds. For structural welds use AWS symbols and clearly show net weld lengths and sizes.

.15 Materials, gauges, and sizes being supplied including connections, attachments, reinforcement, anchorage and locations of exposed fastenings.

.16 Installation instructions and details for *Products* to be installed by separate *Subcontractors*, including function of each part.

.17 A list of *Products* covered by, or included on, the shop drawing. List of *Products* shall be complete and show manufacturer's name, *Product* name, generic description, standard certification where specified, manufacturer's complete installation data and precautions against wrong installation, operation and maintenance.

.18 Refer to individual sections of the *Specifications* for more particular requirements for *Shop Drawings*.

.19 Compatibility statement: Include with each *Shop Drawings* a statement that each *Product* and material indicated on the *Shop Drawings* is compatible with each *Product* and material with which it comes into contact.

1.7 Engineered Judgements

.1 When an engineered judgement is required by authorities having jurisdiction, such engineered judgement shall be prepared as an engineered submittal in accordance with Section 01 33 00.

1.8 Project Firestopping Manual and Coordination

.1 The *Contractor* shall assign a firestopping and smoke seal firestopping coordinator to coordinate the firestopping details and systems required in the *Work*. Applicator shall designate a single individual as *Project* foreperson who shall be present at the *Place of the Work* throughout the *Work*.

.2 Firestopping manual:

.1 *Contractor* and firestopping and smoke seal coordinator shall prepare a preliminary fire stopping manual, inclusive of all firestopping systems in the *Work*, to be submitted to the *Consultant* prior to the installation of any firestopping and smoke seal work.

.2 Manual shall include:

.1 Project key plans of each level, with enlarged key plans at areas where required, which identify and tag each anticipated penetration and fire stopping location and type (i.e. multiple metallic pipes though gypsum board wall assembly; single metallic pipe though concrete floor assembly, and the like).

.2 *Product* data sheets: data and installation instructions for *Products* providing descriptions sufficient for identification at the *Place of the Work*.

.1 Materials list of *Products* proposed for use in the *Work*; complying with listed systems designs.

.2 Listing agency's detailed drawing showing joint assemblies and firestopping materials, identified with listing agency's name and number or designation, fire rating achieved, and date of listing.

.3 Manufacturers' installation instructions and recommendations.

.3 *Shop Drawings*:

.1 Submit drawings indicating fire resistance rated assembly number, required temperature, hose stream, and flame rating, material thicknesses, installation methods and materials of firestopping and smoke seals, primers, supports, damming materials as applicable, reinforcements, anchorages, fastenings and methods of installation for each condition to be encountered.

.2 Designate on *Shop Drawings* static through penetrations and dynamic joint systems, relative positions, expansion and control joints in rated slabs and walls, and firestopping details.

.3 Engineered *Shop Drawings*; for engineering judgements:

.1 Where *Project* conditions require modification to an accredited third party testing agency's listed system design to address a particular firestopping condition that is not covered by a listed system, submit engineered shop drawings detailing the modifications to the listed system design as an engineering judgment or equivalent fire-resistance-rated assembly, for each *Project* location and condition.

.2 Submit the manufacturer's engineering judgment identification number and *Shop Drawings* details prepared by a professional engineer. The engineering judgment submittal shall include both *Project* name, *Project* location, and *Subcontractor's* name who will install firestop system as described in engineering judgement *Shop Drawings*.

.3 Provide complete details of specific application of listed system and its modifications upon which the engineered judgement is based upon.

.4 For perimeter fire barrier systems:

.1 Submit engineered *Shop Drawings* for engineering judgements covering perimeter fire barrier systems. Identify each cladding assembly type in contact with each perimeter fire barrier system.

.4 Fire resistance rating test listings for firestopping and smoke seal systems.

.3 Firestopping manual shall be submitted within 4 weeks of *Contract* award.

.4 Prior to concealment of firestopping conditions above a ceiling or by another assembly or finish, the *Contractor* shall submit an updated firestopping manual including as-built drawings that identify firestopping conditions and penetrations.

.3 Closeout submittals:

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Submit the following certification documents with closeout submittals:

.1 Manufacturer's certification: Submit manufacturer's certification that installed firestopping and smoke seal *Products* are suitable for the use indicated and comply with specified requirements.

.2 Installation certification: Installer shall submit certification that all joint firestopping system installations are completed and that installations comply with listed systems designs.

.3 As-built copy of the firestopping manual.

1.9 Samples

.1 Submit a minimum of 3 samples unless a greater amount is specified.

.2 Deliver samples to the following location with expenses, including carrying costs, prepaid, unless otherwise instructed:

.1 *Consultant's* office.

.3 Identify samples or assemblies by *Project* number and name, name of *Consultant*, *Contractor* and *Subcontractor*, and date of submission. Identify location, specified material reference and any other pertinent information. Show construction by layered method if necessary, clearly displaying textures and patterns.

.4 Where a required colour, pattern or texture has not been specified, submit full range of available *Products* meeting other specified requirements.

.5 *Consultant* selection from samples is not intended to change the *Contract Price* or *Contract Time*. If a selection would affect the *Contract Price* or *Contract Time*, notify *Consultant* in writing prior to proceeding with the *Work*.

.6 Resubmit samples until written acceptance is obtained from *Consultant*.

.7 Reviewed and accepted samples will establish the standard against which installed *Work* will be reviewed.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 *Contractor's* quality assurance program.

.2 *Contractor's* field quality control.

.3 Subcontractor Qualification Statements

.4 Independent inspection and testing – *Owner's* Quality Assurance.

.5 Inspection and testing schedule.

.6 Reports and documents.

.7 Manufacturer's field review.

.8 Mock-ups.

1.2 *Contractor's* Quality Assurance Program

.1 Submit to the *Owner* and the *Consultant* for their information, a quality assurance program (the "Quality Assurance Program").

.2 The Quality Assurance Program shall meet the requirements of Canadian Standards Association CSA Z299.3 or such other requirements as set out in the *Contract Documents*.

.1 The Quality Assurance Program shall be designed so that quality requirements are obtained by progressive implementation of the controls and inspection functions stated in the Quality Assurance Program.

.2 Make any modifications to the Quality Assurance Program as reasonably requested by the *Owner* and/or the *Consultant*.

.3 The Quality Assurance Program shall include, but shall not be limited to, the following:

.1 A system by which changes to the *Contract Documents* and correspondence with *Subcontractor* and other correspondence is handled in a controlled manner.

.2 A system for purchased or manufactured materials to be identified, inspected to the specified standard, and covered by a material test report.

.3 A system by which measuring and testing equipment is properly stored, handled, and calibrated to a known standard.

.4 A system by which incoming materials are: inspected to the specified standard; accepted; allocated safe storage; and properly recorded.

.5 A system by which process inspection requirements shall be clearly stated for operations and carried out by qualified personnel.

.6 A system by which final inspections will be carried out and accepted by authorized personnel prior to release for shipping or major assembly.

.7 A system by which non-conformance to requirements of the *Contract Documents* shall be recorded and solutions proposed by the *Owner* or the *Consultant* are also recorded.

.8 A system by which instructions for handling and storage of equipment shall be given.

.9 A system by which SBO items can be inspected and received in a manner which allows replacement or correction.

.10 A system by which a record of quality inspections, tests, and actions shall be kept, including field quality control.

.11 A system by which the *Owner* and the *Consultant* shall be afforded access to manufacturing areas and quality records and issued with copies of pertinent drawings and manufacturing schedules.

.3 Provide the *Owner* and the *Consultant* with regular Quality Assurance Reports for their information according to an agreed schedule.

1.3 *Contractor's* Field Quality Control

.1 Provide and be responsible for field quality control throughout the *Work*, including quality control of *Subcontractors* and major *Suppliers*.

.2 Ensure that the only specified or approved *Products* and materials are used.

.3 Provide and maintain an effective quality control program, in accordance with the Quality Assurance Program, and perform inspections and tests to ensure compliance with *Contract Documents*.

.4 Furnish appropriate facilities, instruments, and testing devices required for performance of the quality control function.

.5 Deliver inspection testing reports or approvals in in accordance with the requirements of Section 01 45 00.

.6 Develop a field quality control manual covering field installation. The form of the manual shall be acceptable to the *Owner* and the *Consultant*. This manual will document field quality control practices of the *Contractor*, *Subcontractors*, and major *Suppliers*. The manual shall include, but not be limited to:

.1 Concrete slab moisture and pH testing and surface preparation, including flatness and levelness.

.2 Surface preparation.

.3 Fastener and anchor installation.

.4 Material compatibility testing.

.5 On line fabrication quality control practices.

.6 Shipping.

.7 Field installation.

.8 Field inspection and testing by *Contractor*.

.9 Field inspection and testing independent.

.7 Inspection and testing shall be performed by company qualified to perform the inspections or tests specified or required by the building code, regulations, by-laws, or authorities having jurisdiction.

.8 Retain and pay for inspection and testing that is for *Contractor's* own quality control or is required by regulatory requirements

.9 Maintain a logbook (copies to be provided to the *Consultant* at completion of fabrication) documenting date, time, results, and significance of in-plant testing carried out, where applicable, linked to daily production. The form of this logbook shall be acceptable to the *Owner* and the *Consultant.*

1.4 *Subcontractor* Qualification Statements

.1 Upon request by the *Consultant*, submit proof, in the form of CCDC 11 - Contractor's Qualification Statement, of qualifications of *Subcontractors* to verify *Subcontractor's* qualifications and experience meet or exceed the requirements of the *Contract Documents.*

.1 If, upon review of the Contractor's Qualification Statement, it is found that the *Subcontractor* does not meet the qualification requirements specified in the *Contract Documents* pertaining to the parts of the *Work* for which the *Subcontractor* has been retained, the *Contractor* shall replace the unqualified *Subcontractor* with a qualified *Subcontractor*, satisfactory to the *Contractor* and the *Owner*, at no additional cost to the *Owner* and at no increase in the *Contract Time.*

1.5 Independent inspection and Testing – *Owner's* Quality Assurance

.1 Independent inspection and testing services are used by the *Owner* to verify compliance with requirements of the *Contract Documents.*

.2 Employment of inspection and testing agencies by *Contractor* or *Owner* does not relieve *Contractor* from responsibility to perform the *Work* in accordance with *Contract Documents.*

.1 Independent inspection and testing services do not relieve the *Contractor* of responsibility for normal shop and site inspection, and quality control of manufacturing and installation.

.2 Specified tests, inspections, and related actions do not limit the *Contractor's* other quality assurance and control procedures that facilitate compliance with the *Contract Documents* requirements.

.3 Requirements for the *Contractor* to provide quality control services required by the *Contract Documents*, *Consultant*, *Owner*, or authorities having jurisdiction are not limited by *Owner's* independent inspection and testing services.

.4 Inspections and tests specified or required that are not specified as independent inspection and testing are the responsibility of the *Contractor* and are not covered under the *Owner's* quality assurance requirements.

.3 The *Consultant* will, on behalf of *Owner*, appoint independent inspection and testing companies, representing, reporting and responsible to the *Owner* through the *Consultant.*

.1 Cost of independent inspection and testing company services will be authorized as a disbursement from Cash Allowance as specified in Section 01 21 00. Independent inspection and testing company shall submit monthly invoice original to *Contractor* for review, relating invoices to tests and inspection reports. Provide original receipts for disbursements. Invoices for inspection and testing services shall be forwarded by *Contractor* to *Consultant* for inclusion in progress payment application.

.4 Additional inspection and testing required because of changes in materials proposed by *Contractor* or *Subcontractors*, by lack of proper notice for inspection and testing specified, or required as a result of failure of such materials to meet requirements of the *Contract Documents* when originally tested, shall be carried out at no additional cost to the *Owner*.

.5 Inspection and testing required by codes or ordinances, or by an authority having jurisdiction, and made by a legally constituted authority, shall be the responsibility of the *Contractor* and shall be paid for by the *Contractor*, is not part of the *Owner's* quality assurance requirements, and shall not be paid by *Owner*, unless otherwise specified in the *Contract Documents*.

.6 Inspection or testing performed exclusively for *Contractor's* convenience shall be sole responsibility of *Contractor*, is not part of the *Owner's* quality assurance requirements, and shall not be paid by *Owner*.

.7 Independent inspection and testing shall be performed by company qualified to perform the inspections or tests specified or required.

.8 Requirements of regulatory companies:

.1 Testing shall be conducted in accordance with requirements of the building code.

.2 Obtain certification where required by the building code and standards.

.9 Cooperation with independent inspection and testing companies:

.1 Provide independent inspection and testing companies with materials and installation information as required and/or requested.

.2 Submit test samples required for testing.

.3 Cooperate with independent inspection and testing companies and give adequate notification of any changes in source of supply, additional work shifts, and other proposed changes.

.4 Provide access to the *Work* for independent inspection and testing companies wherever the *Work* is in progress, or wherever *Products*, materials, or equipment are stored prior to shipping.

.5 Provide labour, *Construction Equipment*, and temporary facilities required to assist independent inspection and testing companies in sampling and making tests.

.10 Inspection and test specimens

.1 Inspection and testing will, generally, consist of procedures listed in the following paragraphs, but additional tests may be performed as required to verify conformance to *Contract Documents*.

.2 Specimens and samples for testing, unless otherwise specified in the *Contract Documents*, shall be taken by the independent inspection and testing company; sampling equipment and personnel shall be provided by the independent inspection and testing company; and deliveries of specimens and samples to the testing company shall be performed by the testing company unless otherwise specified.

.3 Independent inspection and testing company shall take samples necessary to verify quality as specified. Taking of samples shall not endanger the structure or life safety, and shall be taken so as to best represent the *Work* as a whole.

.4 Samples shall be handled, packaged, stored and delivered in accordance with specified tests. Sample handling where required shall duplicate conditions at the *Place of the Work* (such as site-cured concrete cylinders).

.11 Where evidence exists that defective workmanship may have occurred, or that the *Work* may have been carried out incorporating defective materials, or where tests demonstrate that installed conditions do not comply with the requirements of the *Contract Documents*, the *Consultant* reserves the right to have additional inspections, tests, analysis, and surveys performed in order to help determine the extent of defect and whether such work must be replaced. Inspections, tests, and surveys carried out under these circumstances will be made at the *Contractor's* expense, and will not be paid by *Owner*, unless the results indicate that the work so tested, inspected or surveyed is not defective or that, in *Consultant's* opinion, the work so tested, inspected, or surveyed may be accepted, in which case tests, inspections or surveys will be paid by *Owner.*

.12 Repair work damaged as a result of independent inspection and testing work.

1.6 Inspection and Testing Schedule

.1 Prepare schedule for inspection and testing company services in accordance with Section 01 32 00 and as follows:

.1 Establishing schedule:

.1 By advance discussion with the selected independent inspection or testing company, determine the appropriate time necessary to perform the required services and to issue related reports.

.2 Allow for required time within construction schedule.

.2 Adherence to schedule:

.1 *Contractor* shall advise independent inspection and testing companies in advance when inspection and testing of the *Work* is required.

.1 Amount of advance notice shall be as required by the independent inspection and testing company, but shall be no less than 2 *Working Days*.

.2 When independent inspection and testing company is ready to perform inspection and testing according to predetermined schedule, but is prevented from inspection and testing or taking specimens due to incompleteness of the parts of the *Work* scheduled for inspection and testing, extra costs for inspection and testing attributable to the delay may be back-charged to *Contractor* at no additional cost to the *Owner*.

.3 Notify independent inspection and testing company at least 3 *Working Days* before work required to be inspected commences, and arrange for a meeting at the *Place of the Work*, to be held 1 *Working Day* before the work starts with the following present:

.1 The *Contractor*, and the *Subcontractor* responsible for the work to inspected and/or tested, the inspection and testing company representatives, the product manufacturer's representative when required, and the *Consultant*.

.4 For inspection and testing required by *Contract Documents* or by authorities having jurisdiction, provide *Consultant* and inspection and testing agencies with timely notification in advance of required inspection and testing.

.5 Give 2 *Working Days*' prior notice to independent inspection and testing company of the commencement of each phase of the *Work* requiring inspection, and provide independent inspection and testing company with materials and installation information.

1.7 Reports and Documents

.1 Inspection and testing company, whether for Owner's quality assurance or for *Contractor's* quality assurance, shall submit shop inspection and site inspection reports within 5 *Working Days* of each inspection.

.2 Distribute reports digitally as follows:

.1 *Owner.*

.2 *Consultant.*

.3 *Contractor.*

.4 Consulting engineers, as applicable.

.3 Inspection and testing companies, whether for *Owner's* quality assurance or for *Contractor's* quality assurance, shall submit a written report for each inspection or test, including pertinent data such as conditions at the *Place of the Work*, dates, test references, locations of tested materials, actual *Product* identification, testing methodology, procedures, and descriptions, site instructions given, recommendations and/or any other information required by standard applicable to reporting of tests and inspections.

.1 Report shall clearly indicate failure of *Product* or procedures to meet applicable standards, give recommendations for retesting or correction. Inspector shall contact *Contractor* and *Consultant* immediately when *Product* or assembly fails to meet requirements of the *Contract Documents*.

.4 Upon completion of portions of the *Work* subject to inspection and testing, whether for *Owner's* quality assurance or for *Contractor's* quality assurance, submit to the *Consultant* duplicate certificates of acceptance of the installation issued by the inspection and testing company.

1.8 Manufacturer's Field Review

.1 Where manufacturer's field review is specified, manufacturer's representative shall review the relevant parts of the *Work* at the *Place of the Work*, or wherever such affected work is in progress, to verify that the relevant parts of the *Work* are being executed in accordance with manufacturer's written requirements and verify their product is fit for the purpose intended.

.2 Manufacturer's field review is to verify that the *Products* specified are being used in the *Work* and are being applied on surfaces prepared in accordance with manufacturer's written requirements and the requirements of the *Contract Documents*.

.3 Unless otherwise indicated, manufacturer's representative shall undertake a minimum of 3 field reviews, with additional reviews as required by the manufacturer, to verify that the relevant parts of the *Work* are in accordance with the manufacturer's written requirements.

.4 Manufacturer's representative shall submit a type-written report on manufacturer's letterhead after each field review following procedures for reports and documents specified in Section 01 45 00. Report shall document manufacturer's representative's field observations and recommendations.

1.9 Mock-Ups

.1 Provide field or shop erected example of work complete with specified materials and workmanship.

.2 Provide field or shop erected mock-ups of *Work* as specified in the *Specifications*. If a mock-up location is not indicated in the *Drawings* or *Specifications*, locate where directed by *Consultant*.

.3 Do not proceed with work for which mock-ups are required prior to *Consultant's* review of mock-ups.

.4 Modify mock-up as required until *Consultant* written acceptance is obtained.

.5 Protect and maintain mock-ups until directed to be removed.

.6 Commence work demonstrated in mock-up only after review and acceptance of workmanship.

.7 Remove mock-ups only when the *Work* they represent is complete or when otherwise directed by *Consultant*.

.8 If possible, mock-up may become part of finished work, at sole discretion, and with prior written acceptance of *Consultant*.

.9 Reviewed and accepted mock-ups shall be the standard of workmanship and material against which installed work will be compared.

.10 Remove and replace materials or assemblies appearing in the finished work that do not match reviewed and accepted mock-ups.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Temporary utilities - general.

.2 Temporary electrical services.

.3 Temporary water supply.

.4 Temporary heating and ventilation.

1.2 Temporary Utilities - General

.1 Provide temporary utilities as specified and as otherwise necessary to perform the *Work* expeditiously.

.2 Arrange and pay for required temporary services, unless otherwise specified.

.3 Provide connection and disconnection of temporary services and facilities required in the *Work*.

.4 Remove temporary utilities after use.

1.3 Temporary Electrical Services

.1 Provide and maintain an adequate temporary electrical service for performance of the *Work* including, but not limited to, operation of electric pumps, motors, vibrators and other power tools, hoisting and related construction and general illumination during the *Work*.

.1 Do not use new building power systems during construction without prior written authorization from *Consultant* and *Owner*.

.2 Provide and maintain any components and equipment necessary to transform supply power to necessary temporary power voltage.

1.4 Temporary Water Supply

.1 Provide and maintain a temporary supply of water for use in the *Work*.

.2 Extend supply pipe or pipes from nearest available sources and maintain in good condition until permanent system is installed and ready for use.

1.5 Temporary Heating and Ventilation

.1 Provide and pay for temporary heating, cooling and ventilating required for the *Work*, including attendance, maintenance and fuel.

.2 Provide temporary heat and ventilation as required to:

.1 Facilitate continuous uninterrupted progress of the *Work*.

.2 Protect the *Work* and *Products* against damage and defacement caused by weather, harmful levels of temperature, humidity, and moisture.

.3 Protect the *Work* against dampness and cold.

.4 Prevent moisture condensation on surfaces, freezing, or other damage to finishes or stored *Products*.

.5 Provide ambient temperatures and humidity levels for proper storage, installation and curing of materials, in accordance with specified standards and manufacturer's requirements.

.6 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Prior to enclosing building, maintain work areas at not less than 7°C. After enclosing, keep premises heated to at least 13°C using temporary heating devices that do not cause moisture and humidity build-up within the facility. Increase temperatures in isolated areas to 20°C as required by various sections of the *Specifications* or by *Product* manufacturers.

.4 Solid fuel salamanders will not be permitted.

.5 Provide temporary heat or adequate protection by means of straw or other coverings to floor slabs, footings, or any part of building not specifically designed to withstand frost penetration.

.6 Furnish other temporary heating as required by various sections of the *Specifications* or by *Product* manufacturers.

.7 Ventilate to the exterior of the building work areas as required when toxic materials are being utilized or cured.

.8 Replace with new, any work damaged due to failure to provide adequate heat at no cost to *Owner*.

PART 2 - PRODUCTS
Not applicable.

PART 3 – EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 General scope and responsibility.

.2 Parking.

.3 Temporary sanitary facilities.

.4 Temporary site office.

.5 Temporary telephone and Wi-Fi.

.6 Fire protection.

.7 Temporary site storage.

.8 Traffic Control and Road Maintenance.

.9 Signs and notices.

1.2 General Scope and Responsibility

.1 Arrange, obtain and pay cost for permits required for temporary facilities and controls.

.2 Provide and maintain temporary facilities for the *Work* and remove them from the *Work* upon issuance of certificate of *Substantial Performance of the Work*.

.3 Do not use permanent facilities during the course of the *Work* unless specific written permission is provided by the *Consultant*. Where use of permanent facilities is granted for temporary construction service, such use of permanent facilities shall not prejudice warranties.

1.3 Construction Parking

.1 Parking for workers shall not be made available by the *Owner*.

.2 Do not interfere with the operation of existing premises. Keep existing parking areas and road system remain free and clear of obstructions resulting from the *Work*.

.3 Illegally parked vehicles that are ticketed and/or towed shall be the sole responsibility of the vehicle owner.

1.4 Temporary Sanitary Facilities

.1 Provide and maintain temporary sanitary facilities for use by workers. The use of existing building's sanitary facilities by workers shall be prohibited.

.2 Use of new sanitary facilities by workers is prohibited.

1.5 Temporary Site Offices

.1 Provide heated, lighted, air conditioned and ventilated site office, of sufficient size to accommodate site meetings for 12 people, and furnished with drawing layout table, filing cabinets, telephone, and Wi-Fi as described below.

1.6 Temporary Telephone and Wi-Fi

.1 Provide and maintain a telephone in temporary site office for exclusive use of *Consultant*, *Contractor*, and *Subcontractors*. Pay phone is not acceptable.

.2 Superintendent shall be equipped with mobile telephone device.

.3 Long distance charges shall be paid by party making call.

.4 Provide and maintain internet access for the *Consultant* and other guests through a high bandwidth WiFi hub capable of supporting traffic with 50 connected devices simultaneously; provide for the use of the *Consultant* a WiFi enabled colour printer capable of printing 11" x 17" format.

1.7 Fire Protection

.1 Provide and maintain temporary fire protection systems and equipment during construction.

.2 Maintain fire access routes, including overhead clearances, for use by emergency response vehicles.

1.8 Temporary Site Storage

.1 Handle and store materials so as to prevent damage or defacement to the *Work* and surrounding property.

.2 Construct weather-tight storage sheds for storage of materials that may be damaged or defaced by weather. Provide floors raised 150 mm (6") clear of ground for storage of *Products*.

.3 *Owner* is not responsible for securing *Products* or materials at the *Place of the Work*.

1.9 Traffic Control and Road Maintenance

.1 Provide and maintain adequate access to *Place of the Work*.

.2 Do not block roads or impede traffic. Keep construction traffic to designated roads only. Provide flagperson to direct traffic as required.

.3 Provide a hard surface area at the *Place of the Work* for cleaning down trucks prior to entry onto municipal roads or private roads outside of the *Place of the Work*.

.4 Keep public and private roads free of dust, mud and debris resulting from truck, machinery and vehicular traffic related specifically to this *Project*, for the duration of *Work*.

.5 Clean roads regularly, public or private. Wash down and scrape flush roads at least daily when earth moving operations take place. Maintain public property in accordance with requirements of authorities having jurisdiction.

.6 Vehicle Cleaning:

.1 Establish a designated vehicle loading point at the *Place of the Work* on a gravel base to minimize tracking of soil off the *Place of the Work*. If the loading point becomes contaminated, it shall be cleaned and replaced.

.2 Vehicles leaving the *Place of the Work* shall be cleaned of loose soil and dust, including tire washing, and sweeping or washing of exteriors and tailgates by a designated labourer.

.3 Keep a daily log of each vehicle leaving the *Place of the Work*, including time of cleaning and name of cleaner.

.4 Tarp vehicles containing indigenous soil or debris leaving the *Place of the Work*.

1.10 Signs and Notices

.1 Project sign:

.1 Design and erect a 1220 x 2440 mm (4' x 8') free standing project sign including overlaid plywood, backing posts, post foundations, framing and installation.

.2 Sign shall contain information regarding the project, *Owner*, *Consultant*, *Contractor* and other information as required.

.3 Sign shall be professionally painted according to the design provided by *Consultant*.

.4 Location of sign: In prominent location to *Consultant* acceptance.

.2 *Consultant* signs:

.1 Install at the *Place of the Work* corporate signs as provided by *Consultant*.

.2 Location of sign: In prominent location to *Consultant's* acceptance.

.3 Mount sign on suitable supports.

.3 No other signs or advertisements, other than safety, warning, or directional signs, are permitted without *Consultant's* prior approval.

PART 2 - PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 General scope and responsibility.

.2 Temporary enclosures and protection.

.3 Protection of the public.

.4 Protection of the *Work*.

.5 Protection of foundations.

.6 Protection of concrete floors to remain exposed in finished work.

1.2 General Scope and Responsibility

.1 Provide and maintain signs, guard-rails, barriers, warning lights and other protection as required by authorities having jurisdiction for safety of the *Place of the Work*. Be responsible for adequacy of protection.

.2 Plant, Machinery and Scaffolding:

.1 Provide formwork, scaffolding, equipment, tools, machinery and incidental appurtenances necessary for the proper execution of the *Work*.

.2 Erect plant, machinery and scaffolding to permit access to building and the *Work*.

.3 Use scaffolds in such manner as to interfere as little as possible with other trades' operations.

.4 Support scaffolds from finished surfaces only after taking precautions to prevent damage. No supports, clips, brackets, or similar devices shall be welded, bolted, or otherwise affixed to any finished member or surface without prior permission.

.3 Maintain temporary barriers and enclosures in good condition for the duration of the *Work*.

.4 Remove temporary barriers and enclosures from *Place of the Work* when no longer required.

1.3 Temporary Enclosures and Protection

.1 Provide temporary enclosures and protection of adequate construction to prevent dispersion of dust and dirt into other areas of existing building and to prevent dispersion of dust and dirt beyond the *Place of the Work*.

.2 Provide temporary weather-tight enclosures and protection for exterior openings in building as soon as walls, floors and roofs are built so as to protect the *Work* from weather and vandalism. Provide doors in enclosures as necessary to maintain fire exits.

.3 Erect, maintain, and relocate enclosures as required to facilitate construction operations and *Owner's* operational requirements.

.4 Temporary enclosure and protection shall be of finished appearance and painted to colour approved by *Owner*.

.5 Provide dust seal and sound resistant enclosures to protect existing building and operations as indicated. Include temporary doors, fastenings and keys.

.6 Insulate and airseal exterior enclosures to prevent condensation and drafts.

1.4 Protection of the Public

.1 Provide fencing, barricades, hoarding, notices and warning boards and maintain lights and signals for protection of workers engaged on the *Work*, for protection of adjoining property and for protection of the public.

.2 Where any special hazard exists from which it is not possible to protect the public safety by other means, watchpersons shall be employed to preserve public safety until the area of special hazard no longer poses a risk to public safety.

1.5 Protection of the *Work*

.1 Protect the *Work* from damage, discolouring, and defacement. Maintain protection until the *Work* is complete.

.2 Have damaged or defaced work corrected by workers meeting qualification requirements of the *Contract Documents*.

.3 Provide minimum 3 mm thick Masonite board protection, or finish flooring manufacturer approved alternative, to all finished floors.

.4 *Contractor* shall provide the *Consultant* a minimum of 15 *Working Days* prior written notice of the intent to drive vehicles or heavy equipment over finished floors or floor slabs and submit supporting data. Any shoring or other supplementary support required shall be provided by the *Contractor* at no increase in the *Contract Price* and at no additional cost to the *Owner*.

.5 Provide plywood protection to precast stair treads, until *Ready-for-Takeover.*

.6 Protect historically important surfaces during the course of the *Work* and remove protection only for the purposes of cleaning or restoration work. Protect such surfaces from damage caused by impacts, moisture, weather, lubricants, corrosive materials, paint, weld spatter, exhaust fumes, and chemicals that could leave stains or residues. Ensure that historically important surfaces are protected from exposure to precipitation by providing temporary flashings at tops of walls and other locations where moisture may collect and enter masonry assemblies.

1.6 Protection of Foundations

.1 In cold and freezing weather, prevent heaving of foundations due to freezing action of ground.

1.7 Protection of Concrete Floors to Remain Exposed in Finished Work

.1 Non-marking protection material shall be placed over concrete floors designated as exposed.

.2 Post the following on warning signs at locations leading to areas of where concrete floors are to remain exposed in finished work (see Concrete Floor Contractors Association of Canada):

.1 Concrete floors shall be protected from staining, damage and excessive loading at all times:

.1 No traffic is permitted on new concrete floors for the first 3 days after placement.

.2 Foot traffic is permitted between 3-7 days after placement (curing materials must be replaced where disturbed by traffic).

.3 Scissorlifts and light equipment are permitted 7 days after slab placement.

.4 Vehicles shall be diapered to prevent oil and other liquid spills (remove leaking equipment from the jobsite immediately).

.5 Tires shall be non-marking or taped with non-marking tape to prevent marking of the floors.

.6 Trucks, forklifts and any other heavy loads may only to be placed on the floor if they have been previously approved by the *Consultant*.

.7 Spills must shall be cleaned up immediately to avoid permanent staining of the concrete.

.8 Concrete shall be protected from scratching and impact damage at all times. No cutting, painting, welding or other injurious activities shall be performed without protecting the concrete from damage prior to the commencement of work.

PART 2 - PRODUCTS
Not applicable.

PART 3 – EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 General scope and responsibility.

.2 Plant Protection.

.3 Security.

.4 Moisture control.

.5 Pest control.

.6 Dust, debris and noise control.

.7 Temporary drainage and dewatering.

.8 Erosion and sediment control.

.9 Snow removal.

.10 Pollution control.

1.2 General Scope and Responsibility

.1 Arrange, obtain and pay cost for permits required for temporary controls.

.2 Provide temporary controls as necessary for performance of the *Work* and in compliance with applicable regulatory requirements.

.3 Maintain temporary controls in good condition for the duration of the *Work*.

.4 Remove temporary controls and *Construction Equipment* used to provide temporary controls from *Place of the Work* when no longer required.

1.3 Plant Protection

.1 Protect trees and other plant material designated to remain on site where indicated. Protect roots from disturbance or damage during excavation and grading. Avoid traffic, dumping and storage of materials over root zones.

.2 Minimize stripping of topsoil and vegetation.

1.4 Security

.1 The *Contractor* shall be solely responsible for securing the *Place of the Work* and the *Work*, and for securing areas used for the storage of *Products* or construction machinery and equipment. The *Owner* shall have no responsibility in this regard.

.1 Provide and maintain security lighting.

.2 Provide and maintain temporary locks. Premises to be locked after working hours.

1.5 Moisture Control

.1 Concrete slabs shall be properly cured and dried before installation of finished flooring assemblies.

.1 Allow for one of the following methods:

.1 Drying time.

.2 Drying action by mechanical methods.

.3 Moisture mitigation coating as specified below.

.4 Drying action by other method and/or materials as approved by affected flooring manufacturer.

.2 Before installation of weather barriers, when materials are subject to wetting, protect as follows:

.1 Protect porous materials from water damage.

.2 Protect stored and installed material from flowing or standing water.

.3 Keep porous and organic materials from coming into prolonged contact with concrete.

.4 Remove standing water from decks.

.5 Keep deck openings covered or dammed.

.3 After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture, protect as follows:

.1 Do not load or install gypsum board or other porous materials or components, or items with high organic content, into partially enclosed building.

.2 Keep interior spaces reasonably clean and protected from water damage.

.3 Periodically collect and remove waste containing cellulose or other organic matter.

.4 Discard or replace water-damaged material.

.5 Do not install material that is wet.

.6 Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

.4 After completing and sealing of the building enclosure but prior to the full operation of permanent heating, ventilation, and air conditioning systems, maintain as follows:

.1 Control moisture and humidity inside building by maintaining effective drying conditions.

.2 Use permanent heating, ventilation, and air conditioning system to control humidity subject to the prior written approval of the *Consultant*.

.3 Comply with manufacturer's written requirements for temperature, relative humidity, and exposure to water limits.

1.6 Pest Control

.1 Provide rodent control and other pest control programs during the *Work* in accordance with the requirements of authorities having jurisdiction.

1.7 Dust, Debris and Noise Control

.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.2 Control dust and dirt produced during the *Work* to prevent dispersion beyond the immediate work areas.

.3 Prevent materials from contaminating air beyond application area, by providing temporary enclosures and ventilation/filtration.

.4 Implement and maintain dust and particulate control measures in accordance with applicable regulatory requirements.

.5 Execute *Work* by methods that minimize dust from construction operations and spreading of dust on site or to adjacent properties.

.6 Provide temporary enclosures to prevent extraneous materials resulting from sandblasting or similar operations from contaminating air beyond immediate work area.

.7 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.8 Use appropriate covers on trucks hauling fine, dusty, or loose materials.

.9 Limit noise levels in accordance with requirements of authorities having jurisdiction and the *Owner*.

.10 Prevent abrasive-blasting, pressure-washing spray, and other extraneous materials from contaminating air beyond application area.

1.8 Temporary Drainage and Dewatering

.1 The *Work* includes the removal of collected groundwater and surface water accumulating from precipitation and groundwater infiltration throughout the course of the *Work* until date of *Substantial Performance of the Work*.

.2 Provide temporary drainage and pumping as necessary to dewater excavations, trenches, foundations, and other parts of the *Work*. Maintain such areas free of water arising from groundwater or surface run-off, as required to keep them stable, dry, and protected from damage due to flooding.

.3 Maintain standby equipment necessary to ensure continuous operation of dewatering system.

.4 Do not pump water containing suspended materials or other harmful substances into waterways, sewers or surface drainage systems. Treat or dispose of such water in accordance with applicable regulatory requirements

.5 Keep drainage lines and gutters open. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep portions of the *Work* properly and efficiently drained during construction and until completion. Be responsible for disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of the *Work*, or due to operations which may cause water to flow elsewhere.

.6 Keep trenches and other excavations free of water. Remove water in a manner that will prevent loss of soil, and maintain the stability of existing soils.

.7 Dispose of such water in a manner that will not be hazardous to public health and safety, private property, or to the *Work*.

.8 Drainage of trenches or other excavation through storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.

.9 When drainage is permitted in writing to be directed to existing catch basins, regularly and at *Substantial Performance of the Work* inspect such catch basins and remove accumulated debris and sediment.

.10 Maintain grades to ensure proper site drainage.

.11 Prevent precipitation from infiltrating or from directly running off stockpiled materials. Cover stockpiled materials with an impermeable liner during periods of work stoppage including at end of each *Working Day*.

.12 Control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas as required to prevent erosion and sedimentation.

.13 Control surface drainage by ensuring that gutters are kept open and water is not directed across or over pavements or sidewalks, except through pipes or properly constructed troughs. Ensure that runoff from unfinished areas is intercepted and diverted to suitable outlets.

1.9 Erosion and Sediment Control

.1 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and watercourses, and repair damage caused by soil erosion and sedimentation.

.2 Provide and maintain appropriate temporary measures such as silt fences, straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and other measures that may be required to prevent erosion and migration of silt, mud, sediment, and other debris.

.3 Do not disturb existing embankments or embankment protection.

.4 Periodically inspect erosion and sediment control measures to detect evidence of erosion and sedimentation. Promptly take corrective measures when necessary.

.5 If soil and debris from site accumulate in ditches or other low areas, remove accumulation and restore area to original condition.

1.10 Snow Removal

.1 Allow no accumulation of ice and snow within the *Place of the Work*. There shall be no use of salt for de-icing in areas of building work.

.2 Clear snow and ice from public sidewalks as required to comply with applicable municipal regulatory requirements.

1.11 Pollution Control

.1 Prevent contamination of soil, water, and atmosphere through uncontrolled discharge of noxious or toxic substances and other pollutants, potentially causing environmental damage.

.2 Be prepared, by maintaining appropriate materials, equipment, and trained personnel on site, to intercept, clean up, and dispose of spills or releases that may occur. Promptly report spills and releases that may occur to:

.1 Authority having jurisdiction.

.2 Person causing or having control of pollution source, if known.

.3 *Owner* and *Consultant*.

.4 Take immediate action to contain and mitigate harmful effects of the spill or release.

PART 2 - PRODUCTS

2.1 Moisture Mitigation Coating

.1 100% solids epoxy one coat system, 0 VOC, suitable for application to 100% RH floors per ASTM F2170-18, designed to protect moisture sensitive adhered flooring systems from elevated moisture and alkalinity levels, warranted by manufacturer to cover subsequent flooring materials and labour, compatible with finish flooring products.

.2 ASTM E96/E96M-10 water vapour transmission (wet methods) performance shall be documented by independent testing laboratory at a minimum 97% for water vapour transmission reduction compared to untreated concrete.

.3 ASTM E96/E96M-10 perm rating shall not exceed a 0.10 Perm rating.

.4 ASTM D1308-02(2013) insensitivity to alkaline environment up to, and including, pH 14 in a 14 day bath test.

.5 Manufacturer certifies acceptance and exposure to continuous topical water exposure after final cure.

.6 Water vapour reduction system shall be a single coat, stand alone system with no requirements for additional components such as sand broadcast for adhesion of flooring systems.

.7 System shall reduce Calcium Chloride readings of up to 25lbs/1000 ft^2/24 hrs by 97% in one coat. System must be able to perform as required with RH Probe readings of 100%.

.8 Acceptable manufacturers that provide *Products* which are known to meet above performance criteria as follows:

.1 Koster American Corporation as distributed by DRE Industries.

.2 Substitutions: in accordance with Section 01 25 00.

PART 3 - EXECUTION

3.1 Moisture Mitigation Coating

.1 Preparation and installation shall be in accordance with manufacturer's written requirements.

.2 Field quality control:

.1 Conduct quality control in accordance with Section 01 45 00

.1 Field tests and inspections:

.1 Test for moisture vapour transmission in accordance with ASTM F710-17 and ASTM F1869-16a or ASTM F2170-18 in accordance with manufacturer's written flooring installation requirements. Results must not exceed 170 µg/m^2 (3 pounds per 1,000 square feet) in 24 hours when tested to ASTM F1869-16a, or exceed 75% when tested to ASTM F2170-18.

.2 Test for surface pH. Levels of pH shall not exceed the written recommendations of the flooring manufacturer and adhesive manufacturer. Test in accordance with ASTM F710-17.

.3 For each test type: Conduct 3 tests for flooring applications up to 93 m^2 (1000 square feet) in area, and 1 additional test for each additional 93 m^2 (1000 square feet) of flooring area.

.4 Testing shall be conducted by independent inspection and testing company and in accordance with Section 01 45 00.

.2 Manufacturer's field review to be in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Availability of *Products*.

.2 *Product* handling.

.3 *Product* requirements and quality.

1.2 Availability of Products

.1 Promptly upon *Contract* award and periodically during construction, review and confirm *Product* availability and delivery times. Order *Products* in sufficient time to meet the construction progress schedule and the *Contract Time*.

.2 If a specified *Product* is no longer available, promptly notify the *Consultant*. The *Consultant* will take action as required.

.3 In the event of delays in supply of *Products*, and should it subsequently appear that the *Work* may be delayed for such reason, *Consultant* reserves the right to substitute more readily available *Products* of similar character, at no additional cost to the *Owner*.

1.3 *Product* Handling

.1 Handle and store *Products* in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturers' and *Supplier's* recommendations and so as to ensure preservation of their quality and fitness for the *Work*, and protect from vandalism and theft.

.2 Store packaged or bundled *Products* in original and undamaged condition with manufacturer's seals and labels intact, facing to outside. Do not remove from packaging or bundling until required in the *Work*.

.3 Store materials susceptible to environmental damage in a weathertight enclosure raised clear of ground so that they are protected from weather, dampness and deterioration. Do not use such materials which have been damaged by exposure to moisture.

.4 Keep sand, when used as ingredients for grout, mortar or similar mixed materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.5 Store sheet materials, lumber and other *Products* susceptible to deterioration on flat, solid supports and keep clear of ground or slab. Slope to shed moisture.

.6 Handle materials to preclude damaging existing surfaces and work of others.

.7 Remove damaged *Products* and replace with new undamaged *Products*.

.8 Transportation:

.1 Pay cost of transportation of *Products* required in performance of *Work*.

.2 Transportation cost of *Products* supplied by *Owner* will be paid for by *Owner*. Unload, handle and store such *Products* at the *Place of the Work*.

.3 Reject *Products* damaged during transport.

.4 Transportation of *Products* must be undertaken to suit construction schedule. *Contractor* is responsible for determining mode of transport to ensure delivery, obtaining *Shop Drawings*, placement of orders, and on-time premium costs, air freight, and the like.

PART 2 - PRODUCTS

2.1 *Product* Requirements and Quality

.1 Compatibility of options: If given option of selecting between two or more *Products*, select *Product* compatible with products previously selected, even if previously selected products were also options.

.1 Unless otherwise indicated in the *Contract Documents*, maintain uniformity of *Product* and manufacturer for any like item, material, equipment or assembly for the duration of the *Work*.

.2 *Products* used for temporary facilities may have been previously used, providing they are sound in structural qualities.

.3 *Products* and *Product* installation shall be in compliance with building code, regulations and requirements of authorities having jurisdiction.

.4 Specified options: The *Work* is based on materials, *Products* and systems specified by manufacturer's catalogued trade names, references to standards, by prescriptive *Specifications* and by performance *Specifications*.

.1 Wherever a *Product* or manufacturer is specified by a single proprietary name, provide the named *Product* only.

.2 Wherever more than one *Product* or manufacturer is specified by proprietary name for a single application, provide any one of the named *Product*.

.3 Wherever a *Product* is specified by reference to a standard only, provide any *Product* that meets or exceeds the specified standard. If requested by *Consultant*, submit information verifying that the proposed *Product* meets or exceeds the specified standard.

.4 Wherever a *Product* is specified by descriptive or performance requirements only, provide any *Product* that meets or exceeds the specified requirements. If requested by *Consultant*, submit information verifying that the proposed *Product* meets or exceeds the specified requirements.

.5 The onus is on the *Contractor* to prove compliance with governing published standards, prescriptive *Specifications* and with performance *Specifications*.

.6 Visual selection *Specifications*:

.1 Where *Specifications* include the phrase "as selected by *Consultant* from manufacturer's full range" or similar phrase, select a product that complies with requirements. *Consultant* will select colour, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

.7 Visual matching *Specifications*:

.1 Where *Specifications* require "match *Consultant's* sample", provide a product that complies with requirements and matches *Consultant's* sample. *Consultant's* decision will be final on whether a proposed product matches.

.5 Provide *Products* that are not damaged or defective, and suitable for purpose intended, subject to specified requirements. If requested by *Consultant*, furnish evidence as to type, source and quality of *Products* provided.

.1 Defective *Products*, whenever identified prior to completion of the *Work*, will be rejected, regardless of previous reviews. Review of the *Work* by the *Consultant* or independent inspection and testing companies does not relieve the *Contractor* of the responsibility for executing the *Work* in accordance with the requirements of the *Contract Documents*, but is a precaution against oversight or error.

.6 Basis of design:

.1 Where *Contract Documents* list "basis of design", this indicates the *Product* or system that was used in the preparation of the design included in the *Contract Documents*, and which may be deemed as an acceptable *Product*.

.2 The basis of design establishes the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products from other manufacturers.

.3 This does not preclude the use of other *Products* or systems in the *Work*, provided the proposed *Product* or system complies with the design and performance requirements contained in the *Contract Documents*, and *Products* or systems proposed for use in the work that are not the named basis of design follow procedures for product substitutions specified under Section 01 25 00.

.7 Where *Contract Documents* require design of a *Product* or system, and minimum material requirements are specified, the design of such *Product* or system shall employ materials specified within applicable section. Where secondary materials or components are not specified, augment with materials meeting applicable code limitations, and incorporating compatibility criteria with adjacent work.

.8 Should dispute arise as to quality or fitness of *Products*, the decision rests strictly with *Consultant* based upon the requirements of the *Contract Documents*.

.9 *Products* exposed in the finished work shall be uniform in colour, texture, range, and quality, and be from one production run or batch, unless otherwise indicated.

.10 *Owner* retains right to select from choices available within specified *Products* for colours, patterns, finishes or other options normally made available. Submit full range of *Product* options in accordance with Section 01 33 00 for such selection.

.11 Exposed to weather: *Products* and materials in environments not protected by the building's HVAC and/or climate control systems shall be considered exposed to weather.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Examination of the *Place of the Work*, documents, surfaces and conditions.

.2 Public utilities and services.

.3 Setting out the *Work*.

1.2 Examination of the *Place of the Work*, Documents, Surfaces and Conditions

.1 Examine the *Place of the Work* and investigate matters relating to the nature of the *Work*, means of access and egress, obstacles, rights and interests of other parties which may be interfered with during the execution of the *Work*, conditions and limitations including obstructions, existing structures or facilities, local conditions, actual levels, character and nature of the *Work*, and other consideration which may affect performance of the *Work*.

.2 Examine the extent of work to be performed and matters which are referred to in the *Contract Documents* prior to start of the *Work*.

.3 Examine work to which work is to be applied, anchored or connected, and relevant as-built conditions.

.4 Each work operation following on a previous work operation of a differing *Subcontractor*, shall include a thorough examination of the condition of the previous work to verify that work is complete and in a condition suitable to receive the subsequent work. Conditions found unacceptable, either for the commencement of the new work or its satisfactory completion, shall be reported in writing to the *Consultant*.

.5 Verify that ambient conditions are suitable before commencing the work of any Section and will remain suitable for as long as required for proper setting, curing, or drying of *Products* used.

.6 Ensure that substrate surfaces are clean, dimensionally stable, cured and free of contaminants.

.7 Do not commence work until unsatisfactory conditions are corrected. Commencement of work shall mean acceptance of surfaces, tolerances, and conditions, and existing conditions will not be accepted as a contributing factor to subsequent failure or unacceptability of the *Work*.

.8 Work adjacent to public property:

.1 Verify before commencing portions of the *Work* adjacent to public and private properties, that no plans for altering clearances, set-backs, easements, grades, or otherwise have been established by authorities having jurisdiction, subsequent to issuance of the building permit.

.2 Notify *Consultant* of any such plans that will affect the *Work* and proceed as directed by *Consultant*.

1.3 Public Utilities and Services

.1 Prior to commencement of the *Work* at the *Place of the Work*, verify limitations imposed on the *Work* by presence of utilities and services, and cause no damage to them as a result of the *Work*.

.2 Before commencing excavation, drilling or other earthwork, establish or confirm location and extent of existing underground utilities and structures at the *Place of the Work*.

.3 Promptly notify *Consultant* if underground utilities, structures, or their locations differ from those indicated in *Contract Documents* or in available project information. *Consultant* will provide appropriate direction.

.4 Notify service authorities concerned so that they may protect, remove, relocate, or discontinue existing utilities and services, as they may require.

.5 Record locations of maintained, re-routed, and abandoned utility lines.

1.4 Setting Out the *Work*

.1 Assume full responsibility for and execute complete layout of the *Work* to required locations, lines and elevations.

.1 Do not change or relocate reference points without prior written notice to *Consultant*.

.2 Report to *Consultant* when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.3 Replace, at no additional cost to the *Owner*, any iron pins and survey bars, monuments, geodetic datum and similar reference markers, which are disturbed, moved, or lost in course of construction. Require registered land surveyor to replace reference points in accordance with original survey.

.2 Arrange meeting with *Consultant* to discuss critical setting out assumptions for the *Work* and establish limiting conditions for setting out the *Work*. *Consultant Contractor* shall chair and prepare minutes of the meeting, and prepare and submit sketches recording understanding of key setting out principles.

.3 Establish sufficient permanent benchmarks on site, referenced to established benchmarks by survey control points.

.4 Establish existing bench marks, grades, lines, levels, and temporary, widely separated bench marks. Employ the services of a firm of registered land surveyors licensed in the *Place of the Work*.

.1 Submit name and address of registered land surveyor performing survey work.

.5 Surveyor shall verify grades, lines, levels at the *Place of the Work*, critical setting out points specified herein, and dimensions shown, and report discrepancies in levels or dimensions before commencing *Work*. Where discrepancies between intended layout and existing conditions are found to exist, prepare and submit a detailed report to *Consultant*, including schematic digital layout of conflicting conditions, in format compatible with AutoCAD 2010 software for *Consultant's* use in reconciling these issues. Surveyor shall lay out building areas, and floor elevations.

.6 Surveyor shall verify location and datum reference elevation of finished foundations, relative to reference markers, showing actual finished grades in relation to noted grades in the *Contract Documents*. Prepare and submit a reproducible plan of survey certified As-Built by above firm and in format compatible with AutoCAD 2010 software, prior to date of *Substantial Performance of the Work*.

.7 Preserve bench marks, reference points and stakes.

.8 Upon completion of foundation work, prepare and submit an accurate survey showing the location of the foundations at the *Place of the Work*, foundation wall dimensions, and the gross floor area of the foundation plan. The survey is to be prepared by a Registered Ontario Land Surveyor acceptable to the *Owner* and to the *Consultant*. Submit a digital copy of this survey to the *Consultant* at time of completion of foundation work. Submit additional copies as part of the closeout submittals in accordance with Section 01 78 00.

.9 Maintain a complete, accurate log of control and survey work as it progresses. Record locations with horizontal and vertical data in project record documents in accordance with Section 01 78 00.

.10 Prepare and submit record survey documents and survey logs for incorporation into project record documents in accordance with Section 01 78 00.

PART 2 - PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Work on public property.

.2 Inserts, anchors, and fasteners.

.3 Penetrations.

.4 Concealed services.

.5 Trademarks and labels.

.6 Interferences.

.7 Publicity releases and photographs.

.8 Manufacturer's instructions.

.9 Galvanic/dissimilar metal corrosion.

.10 Workmanship.

.11 General construction tolerances.

1.2 Work on Public Property

.1 Include curb cuts and making good of existing property to provide fully paved and finished approaches to requirements of authorities having jurisdiction.

.2 Include making good of existing curbs, walks, paving and soft landscaping on adjacent property.

1.3 Inserts, Anchors, and Fasteners

.1 Use only factory made, threaded or toggle type inserts as required for supports and anchors, properly sized for load to be carried.

.2 Where inserts cannot be placed, use factory made expansion shields for light weights only.

.3 Supply and locate inserts, holes, anchor bolts and sleeves during placement or fabrication of structural elements.

.4 Fasteners stressed in withdrawal are not acceptable, except where otherwise indicated.

.5 Prevent electrolytic action and corrosion between dissimilar metals and materials by using suitable non-metallic strips, washers, sleeves, or other permanent separators to prevent direct contact.

.6 Use non-corrosive fasteners and anchors for securing exterior work and in spaces where high humidity levels are anticipated.

.7 Space anchors within individual load limit or shear capacity and install such that they provide positive permanent anchorage.

.8 Keep exposed fastenings to a minimum, space evenly and install neatly.

.9 Fastenings for prefinished materials shall be of concealed type unless otherwise indicated, and when exposed finish is required, of matching prefinishing materials.

.10 Do not use fastenings or fastening methods that may cause spalling or cracking of material to which anchorage is made.

.11 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.12 Bolts shall not project more than one diameter beyond nuts.

.13 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials being fastened.

.14 Power actuated fasteners:

.1 Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E1190-11 conducted by a qualified independent testing agency.

.2 Do not use power actuated fasteners which are stressed in withdrawal in finished work.

.3 Do not use power actuated fasteners within 100 mm (4") of the edge of concrete or masonry, unless otherwise accepted in writing by *Consultant*.

.4 Do not use power actuated fasteners in post-tensioned concrete.

1.4 Penetrations

.1 Holes or voids created in assemblies or partitions for penetrating mechanical, electrical, or sprinkler service items, shall be of sufficient size to accommodate the penetrating item as well as additional required fill materials, such as sealants, firestopping and smoke sealants, insulation, and the like, without exceeding the maximum opening allowable by the manufacturer of the additional required fill material.

.2 When penetrating fire rated walls, ceiling, or floor assemblies, completely seal voids with firestopping materials, smoke seals, or both, in full thickness of the construction element as required to maintain the integrity of the fire rated assembly.

1.5 Concealed Services

.1 Unless otherwise indicated, conceal pipes, ducts, and wiring in floors, walls, and ceilings in finished areas. Do not conceal until after:

.1 Review by *Consultant* and authority having jurisdiction.

.2 Recording actual locations on as-built drawings where locations differ from those shown on *Drawings*.

.2 Provide incidental furring or other enclosures as required.

.3 Notify *Consultant* in writing of interferences before installation.

1.6 Trademark and Labels

.1 Trademarks and labels, including applied labels, shall not be visible in finished work in finished areas, unless otherwise accepted or indicated by *Consultant*, and except for trademarks and labels:

.1 That are essential to identify materials, systems, assemblies, and equipment for maintenance and replacement purposes.

.2 That are essential for life safety, fire resistance, and temperature rise ratings.

1.7 Interferences

.1 Coordinate placement of equipment to ensure that components will be properly accommodated within spaces provided prior to commencement of the *Work*.

.2 Take complete responsibility for remedial work that results from failure to coordinate aspects of work prior to its fabrication/installation.

.3 Provide accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment in layout of equipment and services, Notify *Consultant* if indicated clearances are in conflict.

1.8 Publicity Releases and Photographs

.1 No press or publicity releases will be permitted without prior written approval of the *Owner*.

.2 No photographs of the *Place of the Work* or of any portion of the *Work* will be permitted without written approval of the *Owner*, except as provided by the *Contract Documents*.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 Manufacturer's Instructions

.1 Install, erect, or apply *Products* in accordance with manufacturer's written requirements. Do not rely on labels or enclosures supplied with *Products*. Obtain written requirements directly from manufacturers.

.2 Notify *Consultant*, in writing, of conflicts between *Contract Documents* and manufacturer's instructions where, in *Contractor's* opinion, conformance with *Contract Documents* instead of the manufacturer's instructions may be detrimental to the *Work* or may jeopardize the manufacturer's warranty.

.3 Improper installation or erection of *Products*, due to failure in complying with these requirements, shall result in removal and re-installation of such *Products* as part of the *Work* at no additional cost to the *Owner*.

.4 Provide manufacturer's representatives with access to the *Work* at all times. Render assistance and facilities for such access so that manufacturer's representatives may properly perform their responsibilities.

3.2 Galvanic/Dissimilar Metal Corrosion

.1 Insulate dissimilar metals from each other by suitable plastic strips, washers or sleeves to prevent galvanic corrosion where conductive liquid or electrolyte exists or may reasonably be expected to exist.

3.3 Workmanship

.1 General:

.1 Execute the *Work* using workers experienced and skilled in the respective duties for which they are employed.

.2 Do not employ an unfit person or anyone unskilled in their required duties.

.3 Remove *Products* or materials that have been broken, chipped, cracked, discoloured, abraded, or damaged during construction period and provide undamaged *Products* or materials meeting the requirements of the *Contract Documents*.

.2 Coordination:

.1 Ensure cooperation of workers in layout of the *Work*. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

.3 Backer plates:

.1 Provide backer plates to support and provide anchorage base to carry loads from surface or recessed applied materials.

.4 Cutting and remedial work:

.1 Perform cutting and remedial work required to make parts of the *Work* come together. Coordinate the *Work* to ensure this requirement is maintained. Comply with requirements of Section 01 73 29.

.2 Notify *Consultant* of, and perform remedial work required to, repair or replace defective or unacceptable work. Ensure that properly qualified workers perform remedial work. Coordinate adjacent affected work as required.

.5 Location of fixtures:

.1 Locations of fixtures, access panels, outlets, and mechanical and electrical items indicated on *Drawings* are approximate only.

.2 Locate fixtures, outlets, and devices to provide minimum interference, maximum usable space, and as required to meet safety, access, maintenance, acoustic, and regulatory, including barrier free, requirements. Architectural drawings will relate these items to known dimensions, such as ceiling tile grid or wall locations and the like.

.3 Obtain *Consultant's* acceptance for precise locations of fixtures, access panels, outlets, mechanical, and electrical items.

.4 *Consultant* reserves the right to relocate electrical outlets and mechanical fixtures at a later date, but prior to installation, without cost, provided that the relocation per outlet does not exceed 3050 mm (10') from the original location.

.5 Promptly notify *Consultant* in writing of conflicting installation requirements for fixtures, outlets, and devices. If requested, indicate proposed locations and obtain approval for actual locations.

.6 Protection of work in progress:

.1 Provide protection required by authorities having jurisdiction.

.2 Protect parts of the *Work* completed or in progress from soiling, abrasion, punctures, damage, and defacement, and maintain protection until the surrounding or overhead work is complete.

.3 Remove and replace materials damaged or defaced as a result of failure to provide adequate protection.

.4 Do not cut, drill, or sleeve any load bearing structural member without written permission of *Consultant*. Comply with requirements of Section 01 73 29.

.5 Do not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety or integrity of the *Work*.

.6 Protect finished flooring from damage. Take special measures when moving heavy loads or equipment on them.

.7 Keep surfaces free of oils, grease or other materials that may damage or deface them or affect bond of applied *Products*.

.8 Protect existing buildings, curbs, roads and lanes. If, during the *Work*, any buildings, curbs, roads or lanes are damaged, bear costs for repairs.

.7 Protection of mechanical and electrical *Products* or materials:

.1 Wrap in protective plastic and seal mechanical and electrical items and equipment prior to and during shipment, storage at the *Place of the Work* and after installation.

.2 Remove protective coverings only to the extent required for installation of the items. Re-install protection immediately following installation.

.3 Remove protective coverings in stages, as work areas are completed, or when directed by *Consultant*.

.8 Operational requirements:

.1 Operable *Products* shall be provided fully operational and ready for intended use.

.2 Adjust operating hardware and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts for smooth squeak-free function, in accordance with manufacturer's requirements.

.9 Alterations:

.1 Restore new or existing work which is altered as a result of the *Work* and *Make Good*.

.2 Materials and workmanship shall match existing materials and workmanship. Exposed materials shall match and blend in with the appearance of the existing undamaged surfaces in all respects including colours, textures, layout, jointing, and material types so as to not vary in appearance when compared to adjacent materials from a viewing distance of 1830 mm (6').

3.4 General Construction Tolerances

.1 Match existing tolerances in every respect unless otherwise specified.

.2 Where tolerances are not defined elsewhere in the *Contract Documents* or building code, construct the *Work* to the following tolerances:

.1 Maximum variation from plumb in vertical lines, surfaces of columns, walls, and arrises:

.1 6.4 mm (1/4") in 3 m (10 ft)

.2 9.6 mm (3/8") in a storey height not to exceed 6 m (20 ft)

.3 12.7 mm (1/2") in 12 m (40 ft) or more

.2 Maximum variation from plumb for external corners, expansion joints, and other conspicuous lines:

.1 6.4 mm (1/4") in any storey or 6 m (20 ft)

.2 12.7 mm (1/2") in 12 m (40 ft) or more

.3 Maximum variation from level of grades for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines:

.1 6.4 mm (1/4") in any bay or 6 m (20 ft)

.2 12.7 mm (1/2") in 12 m (40 ft) or more

.4 Maximum variation from drawing location of columns, walls, and partitions:

.1 12.7 mm (1/2") in any storey or 6 m (20 ft)

.2 19 mm (3/4") in 12 m (40 ft) or more.

.5 Maximum variation in cross-sectional dimension of columns and thicknesses of wall from dimensions indicated:

.1 Minus 6 mm (1/4")

.2 Plus 12.7 mm (1/2")

.6 Maximum variation from plane or from straight:

.1 3.2 mm (1/8") in 3 m (10 ft) under a 3 m (10 ft) straight edge.

.7 Maximum variation from angle indicated:

.1 10 seconds.

.8 Tolerances shall be non-cumulative.

END OF SECTION

PART 1 - GENERAL

1.1 Request for Cutting, Patching and Remedial Work

.1 Submittal Items:

.1 Comply with administrative requirements of Section 01 33 00.

.2 Submit written request in advance of cutting, coring, and alteration that affects or is likely to affect:

.1 Structural integrity of any element of *Work*.

.2 Integrity of weather-exposed or moisture-resistant elements.

.3 Efficiency, maintenance, or safety of any operational element.

.4 Visual qualities of sight-exposed elements.

.5 *Owner* or work of other contractors.

.6 Warranty of *Products* affected.

.3 Include in request:

.1 Identification of *Project*.

.2 Location and description of affected work, including drawings or sketches as required.

.3 Statement on necessity for cutting or alteration.

.4 Description of proposed work, and *Products* to be used.

.5 Alternatives to cutting and patching.

.6 Effect on *Owner* or work of other contractors.

.7 Written permission of affected separate contractor.

.8 Date and time work will be performed.

.9 Non-destructive structural survey: Radiography (X-ray) imaging of work to be cut or cored.

.4 Do not commence cutting, patching, or remedial work until request has been reviewed by *Consultant*.

PART 2 - PRODUCTS

2.1 Materials

.1 Unless otherwise specified, when replacing existing or previously installed *Products* in the course of cutting and patching work, use replacement *Products* of the same character and quality as those being replaced.

.2 If an existing or previously installed *Product* must be replaced with a different *Product*, submit request for substitution in accordance with Section 01 25 00.

PART 3 - EXECUTION

3.1 Preparation

.1 Inspect existing conditions in accordance with Section 01 71 00, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of the *Work*.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to maintain structural integrity of surroundings. Provide devices and methods to protect other portions of the *Work* from damage.

.5 Provide protection from elements for areas which may be exposed by uncovering work.

.6 Where uncovering of area exposes local deterioration, cracking, evidence of water infiltration, structural settlement, previous modifications, or other unexpected conditions, advise *Consultant* immediately in writing and leave conditions exposed until receipt of *Consultant's* written instructions. If area is exposed to the exterior, provide temporary protection from inclement weather.

3.2 Existing Services and Utilities

.1 Protect, relocate, or maintain existing active services or utilities except where breaking into or connecting to them. When inactive services are encountered, cap off in a manner approved by authority having jurisdiction and stake or otherwise record location of capped service. Record location of services, including depth, on as-built drawings.

.2 When breaking into or connecting to existing active services or utilities, execute the *Work* at times approved by *Owner*, with a minimum of disturbance to *Owner's* ongoing operations, the *Work*, and traffic. Give notice to authorities having jurisdiction as required by such authorities.

.3 Keep duration of interruptions to a minimum.

.4 Carry out interruptions outside regular working hours of occupants unless *Owner's* prior written approval is obtained.

.5 Construct or erect barriers in accordance with Section 01 56 00 as required to protect pedestrian and vehicular traffic.

3.3 Cutting and Patching

.1 Coordinate and perform the *Work* so that cutting and patching work is kept to a minimum.

.2 Execute cutting, fitting, and patching to complete the *Work*. Under no circumstances will overcutting of corners of opening be accepted. Ensure corners of openings to be cut are predrilled or sawed.

.3 Remove and replace defective and non-conforming work.

.4 Remove samples of installed work for testing if directed by *Consultant*.

.5 Provide openings in non-structural elements of the *Work* for penetrations of mechanical and electrical work.

.6 Perform work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.

.7 Employ qualified installer with at least 3 years of relevant experience to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.8 Perform cutting, patching, and remedial work using competent and qualified specialists familiar with the *Products* affected, in a manner that neither damages nor endangers the *Work*.

.9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed to be used anywhere within existing buildings unless approved by *Consultant*.

.10 Restore work with new *Products* in accordance with requirements of *Contract Documents*.

.11 Fit work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and with suitable allowance for deflection, expansion, contraction, and firestopping.

.12 Enclose pipes, ducts, conduit and wires passing through floors at areas where faucets occur in a 100 mm (4") high metal sleeve and make air and watertight with water resistant firestopping.

.13 Completely seal voids of penetrations of fire rated wall, ceiling, and floor constructions with firestopping and smoke seals.

.14 Execute cutting, patching, and remedial work in manner that does not jeopardize manufacturers' warranties.

.15 Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection. Refinish entire assembly units.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Waste management.

.2 Storage, handling, and protection.

.3 Coordination.

.4 Cleaning.

.5 Disposal of waste.

1.2 Waste Management

.1 Comply with requirements of authorities having jurisdiction.

.2 Do not bury rubbish and waste materials at the *Place of the Work*.

.3 Do not dispose of waste into waterways or storm or sanitary sewers.

.4 Do not burn waste materials at the *Place of the Work*.

.5 Comply with waste disposal requirements of authorities having jurisdiction.

.6 Remove waste material from the *Place of the Work* daily. If waste is collected in bins, bins to be removed from site once full.

.7 Arrange and pay for removal of debris and waste from the *Place of the Work*.

.8 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Pay fees.

1.3 Storage, Handling and Protection

.1 Store, materials to be reused, recycled and salvaged in locations to prevent contamination of materials being diverted from landfill.

.2 Prevent contamination of materials to be salvaged and recycled, and handle such materials, in accordance with requirements for acceptance by designated facilities.

1.4 Coordination

.1 Coordinate waste management and disposal procedures and requirements with other activities at the *Place of the Work* so that there is no delay in the *Work*, and at no increase in either the *Contract Time* or the *Contract Price*.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 Cleaning

.1 General cleaning requirements:

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile wastes in covered metal containers, and remove from *Place of the Work* daily.

.3 Prevent accumulation of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances. Do not rely on building ventilation systems for this purpose.

.5 Prevent cross-contamination during the cleaning process.

.6 Notify the *Consultant* of the need for cleaning caused by *Owner* or other contractors.

.2 Materials:

.1 Use only cleaning materials in accordance with written requirements of manufacturer of surface to be cleaned and in accordance with written requirements of cleaning material manufacturer.

.3 Cleaning during construction/progressive cleaning:

.1 Clean-up the *Place of the Work* daily. Maintain clean and clear egress routes at all times.

.2 Maintain *Place of the Work*, grounds and public properties free from accumulations of waste materials and rubbish.

.3 Provide appropriate, clearly marked containers at the *Place of the Work* for collection of waste materials and rubbish. Remove waste materials and rubbish from the *Place of the Work* when containers become full.

.4 Clean interior building areas prior to start of finish work and maintain free of dust and other contaminants during finishing operations.

.5 Vacuum and clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until *Substantial Performance of the Work*.

.6 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces nor contaminate building systems.

.7 Promptly as the *Work* proceeds, on a daily basis and upon completion, clean up and remove rubbish, surplus materials and equipment.

.8 Remove as the work of this section progresses, corrosive and foreign materials which may set or become difficult to remove at time of final cleaning or which may damage members.

.9 Wash exposed surfaces with a cleaning solution approved by *Product* manufacturers.

.10 Debris and waste not permitted within cavities of *Work*.

.4 Cleaning Prior to Ready-for-Takeover:

.1 Immediately prior to *Consultant's* review to determine if Ready-for-Takeover has been achieved, remove surplus *Products* and construction machinery and equipment not required for the performance of the remaining *Work* and clean in accordance with Final Cleaning paragraphs in Section 01 74 00 to the greatest extent practicable given work remaining to be completed. Cleaning shall be to a sufficient extent to permit the *Consultant's* review to be performed properly and reasonably.

.5 Final cleaning:

.1 Before final cleaning, arrange a meeting at *Place of the Work* to determine the acceptable standard of cleaning. Ensure that *Owner*, *Consultant*, and *Contractor* are in attendance.

.2 Remove from *Place of the Work* surplus *Products*, waste materials, recyclables, Temporary Work, and Construction Equipment not required to perform any remaining work and other than that caused by the *Owner*, and leave the *Work* clean and suitable for occupancy by *Owner.*

.3 Remove waste material and debris from crawlspaces and other accessible concealed spaces.

.4 Clean and polish prefinished and finished surfaces including: glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or otherwise damaged glass.

.5 Clean exterior and interior window glass and frames.

.6 Remove stains, spots, marks and dirt from decorative parts of the *Work*, electrical and mechanical fixtures, furniture fittings, walls, and floors.

.7 Vacuum clean and remove dust from building interiors, exposed wall, floor, and ceiling surfaces, behind grilles, louvres, and screens, and above suspended ceiling tiles and panels. Vacuum clean interior of electrical equipment.

.8 Clean floor finishes in accordance with manufacturer's written requirements.

.9 Remove non-permanent labels.

.10 Remove dirt and residue from surfaces.

.11 Inspect finishes, fittings and equipment and ensure specified workmanship and operation.

.12 Remove protective coatings, clean surfaces and remove excess compounds and sealant materials. Make good defective, scratched or damaged work.

.13 Broom clean and wash exterior walks, steps, paved areas, and surfaces.

.14 Remove dirt and disfigurations from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, downspouts, and drainage systems.

.16 Clean equipment and fixtures to a sanitary condition,

.17 Remove seal wrap and protective coverings from mechanical and electrical *Products* and materials and clean as required.

.18 Clean mechanical, electrical, and other equipment. Replace filters for mechanical equipment.

.19 Clean and/or replace lighting reflectors, lamps, light fixtures, lenses, bulbs, and other lighting surfaces, and grilles.

.20 Clean architectural concrete to remove surface discolouration, efflorescence, and the like. Use a suitable cleaning agent which will not stain the surfaces or mar the texture.

.21 Use leaf blowers to clean landscaped surfaces.

.22 Lock or otherwise restrict access to each room or area after completing final cleaning in that area.

.23 Re-clean as necessary areas that have been accessed by *Contractor's* workers prior to *Owner* occupancy.

3.2 Disposal of Waste

.1 Remove waste materials and recyclables from work areas, separate, and deposit in designated containers at end of each *Working Day*. Collect packaging materials for recycling or reuse.

.2 Handle waste materials not reused, salvaged or recycled in accordance with appropriate regulations and codes.

.3 Remove waste materials and recyclables from *Place of the Work* at weekly intervals or when containers are full, whichever happens more frequently.

.4 Deliver to nearest appropriate depot materials accepted for recycling by region or municipality having jurisdiction over the *Place of the Work*, including but not limited to cardboard, paper, plastic, aluminum, steel, and glass. Deliver to nearest appropriate depot scrap and excess gypsum wallboard for recycling of this material. Costs for this work are included in the *Contract Price*.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Pay fees.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 General *Contract* closeout procedures.

.2 *Substantial Performance of the Work*.

.3 Ready-for-Takeover.

.4 Inspection and review before Ready-for-Takeover.

.5 Partial user occupancy.

.6 Final inspection for completion of the *Contract*.

.7 Warranty period.

1.2 General *Contract* Closeout Procedures

.1 The procedures for completing *Contract* and acceptance by the *Owner* shall be in accordance with the methods described in OAA/OGCA Document 100 (July 1, 2018, and reissued January 8, 2019) and any additional requirements described below.

.2 Stages will be reviewed at the *Contract* start-up meeting to ensure that parties understand their responsibilities. Refer to Section 01 31 19 for procedures and requirements for *Contract* start-up meeting.

.3 Within 4 weeks of commencement of the *Work*, submit to the *Consultant* a list of closeout submittals required by the *Contract Documents*.

1.3 *Substantial Performance of the Work*

.1 The prerequisites to, and the procedures for, attaining *Substantial Performance of the Work*, or similar such milestone as provided for in the Construction Act, shall be:

.1 In accordance with the methods described in OAA/OGCA Document 100 (July 1, 2018, and reissued January 8, 2019).

.2 As described in Section 01 77 00.

.3 Independent of those for attaining Ready-for-Takeover of the *Work*.

.4 In accordance with the Construction Act.

.2 Deficiency review:

.1 Neither *Owner* nor *Consultant* will be responsible for preparation or issuance of extensive lists of deficiencies. *Contractor* assumes prime responsibility for ensuring that items shown and described in the *Contract Documents* are complete. Any reviews to approve the certificate of *Substantial Performance of the Work* will be immediately cancelled if it becomes obvious to the *Consultant* that extensive deficiencies are outstanding.

.2 The *Contractor* shall conduct an inspection of the *Work* to identify deficiencies and defects, which shall be repaired. When the *Contractor* considers that the *Work* is substantially performed, the *Contractor* shall prepare and submit to the *Consultant* a comprehensive list of items to be completed or corrected (the deficiency list) and apply for a review of the *Work* by the *Consultant* to determine if *Substantial Performance of the Work* has been achieved.

.3 The *Contractor's* request described above shall include a statement by *Contractor* that the *Work* to be reviewed by *Consultant* for deficiencies is, to the best of the *Contractor's* knowledge, in compliance with *Contract Documents*, reviewed *Shop Drawings*, and samples, and that deficiencies and defects previously noted by *Consultant* have been repaired.

.4 No later than 10 *Working Days* after the receipt of the *Contractor's* request described above, but contingent upon the prior receipt, by the *Consultant*, of the closeout submittals in the manner and form specified in Section 01 78 00, the *Consultant* and the *Contractor* will review the *Work* to identify any defects or deficiencies. If necessary, the *Contractor* shall tabulate a list of deficiencies to be corrected prior to *Substantial Performance of the Work* being certified by the *Consultant*. During review, the *Consultant* and the *Contractor* will decide which deficiencies or defects must be rectified before *Substantial Performance of the Work* can be certified, and which defects are to be treated as warranty items.

.5 Provide a schedule of planned deficiency review having regard to the foregoing.

.3 Certification of *Substantial Performance of the Work*:

.1 When the *Consultant* considers that the deficiencies and defects have been completed and that it appears that the requirements of the *Contract Documents* have been substantially performed, the *Consultant* shall issue a certificate of *Substantial Performance of the Work* to the *Contractor*, stating the date of *Substantial Performance of the Work*.

.2 The certificate of *Substantial Performance of the Work* shall be prepared and issued in accordance with the Construction Act.

.1 Inform *Owner*, *Consultant*, *Subcontractors*, and *Suppliers* which publication is to be used for publishing certificate of substantial performance in accordance with Section 01 31 19.

1.4 Ready-for-Takeover

.1 The prerequisites to attaining Ready-for-Takeover of the *Work* are described in the General Conditions of the *Contract*.

1.5 Inspection and Review Before Ready-for-Takeover

.1 *Contractor's* Inspection: Before applying for the *Consultant's* review to establish Ready-for-Takeover of the *Work*:

.1 Ensure that the specified prerequisites to Ready-for-Takeover of the *Work* are completed.

.2 Conduct an inspection of the *Work* to identify defective, deficient, or incomplete work.

.3 Prepare a comprehensive and detailed list of items to be completed or corrected.

.4 Provide an anticipated schedule and costs for items to be completed or corrected.

.2 *Consultant's* Review: Upon receipt of the *Contractor's* application for review, together with the *Contractor's* list of items to be completed or corrected, the *Consultant* and the *Contractor* shall arrange a mutually satisfactory agreed date and time to jointly review the *Work*. The *Consultant* will advise the *Contractor* whether or not the *Work* is Ready-for-Takeover. Add additional items, if any, to the *Contractor's* list of items to be completed or corrected. Provide the *Consultant* with a copy of the revised list.

.3 Maintain the list of items to be completed or corrected and promptly correct or complete defective, deficient and incomplete work. The *Contractor's* inspection and *Consultant's* review procedures specified above shall be repeated until the *Work* is Ready-for-Takeover and no items remain on the *Contractor's* list of items to be completed or corrected.

.4 When the *Consultant* determines that the *Work* is Ready-for-Takeover, the *Consultant* will notify the *Contractor* and the *Owner* in writing to that effect.

1.6 Partial User Occupancy

.1 If partial *Owner* occupancy of a part of the *Work* is required before the date of Ready-for-Takeover of the entire *Work* of the *Contract*, the provisions of this Section shall apply, to the extent applicable, to that part of the *Work* that the *Owner* intends to occupy.

1.7 Final Inspection for Completion of the *Contract*

.1 Deficiencies and defects shall be made good before the *Contractor* submits a written request for final review of the *Work* and before the *Contract* is considered complete.

.2 When *Contractor* is satisfied that the *Work* is complete, and after the *Contractor* has reviewed the *Work* to verify its completion in accordance with the requirements of the *Contract Documents*, the *Contractor* shall submit a written request for a final review by the *Consultant*, who in turn will notify the *Owner.*

.3 If there are any deficiencies identified as a result of this review, they shall be listed by the *Consultant* and submitted to the *Contractor*. This list shall be recognized as the final deficiency list for purposes of acceptance of the *Work* under the *Contract*.

.4 Such deficiencies shall be corrected by a date mutually agreed upon between *Consultant* and the *Contractor*, unless a specific date is required by *Contract*, and a further review by the *Consultant* shall be called for by the *Contractor* following his own review to take place within 7 days from date of request.

.5 *Contractor* shall thereafter submit invoice for final payment.

.6 Money withheld for deficiency work shall be released only when all deficiencies have been completed. No partial payment to be recognized until all work is completed.

1.8 Warranty Period

.1 Provide on-going review and attendance to building call-back, maintenance and repair problems during the warranty periods.

.2 At the beginning of the 12th month after Ready-for-Takeover, the *Owner*, *Contractor* and *Consultant*, along with key *Subcontractors* as designated, shall carry out a complete review of building and its systems to determine which deficiencies are to be rectified under the warranty. *Contractor* shall be responsible for timely written notification of *Owner*, and *Consultant* prior to such end of warranty period inspection and any delay in such notification shall extend such warranty period until proper notification is received by *Owner*, and *Consultant*.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 As-built documents.

.2 Operation and maintenance manuals.

.3 Operation and maintenance book.

.4 *Project* data book.

.5 Shop drawing book.

.6 Warranty book.

.7 Posted operating instructions.

.8 Spare parts, maintenance materials, and special tools.

1.2 Administrative Requirements

.1 Collect reviewed submittals, and assemble required closeout submittals executed by *Subcontractors*, *Suppliers*, and manufacturers. Prior to submitting closeout submittals to the *Consultant*:

.1 Review maintenance manual contents (operating, maintenance instructions, as-built drawings, materials) for completeness.

.2 Review supply and completeness of spare parts required by *Contract Documents* and manufacturers.

.3 Review in relation to *Contract Price*, *Change Orders*, *Change Directives*, holdbacks and other adjustments to the *Contract Price*.

.4 Review inspection and testing reports to verify conformance to intent of *Contract Documents* and that changes, repairs or replacements have been completed.

.5 Execute transition of performance bond and labour and materials payment bond to warranty period requirements.

.6 Submit a final statement of accounting giving total adjusted *Contract Price*, previous payments, and monies remaining at time of application for completion of the *Contract*. *Consultant* will issue a final change order reflecting approved adjustments to *Contract Price* not previously made.

.2 No later than 10 *Working Days* prior to submitting request for *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved, submit to the *Consultant* the closeout submittals specified in this section and elsewhere in the *Contract Documents*.

.3 For equipment put into use with *Owner's* permission during the *Work*, submit required closeout submittals within 10 *Working Days* after start-up.

.4 For items of the *Work* delayed materially beyond date of *Substantial Performance of the Work*, provide updated closeout submittals within 10 *Working Days* after acceptance, listing date of acceptance as start of warranty period.

.5 Neither the *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved, nor acceptance of the *Work*, will take place until receipt, by the *Consultant*, of acceptable copies of the closeout submittals required herein and by the *Contract Documents*.

1.3 As-Built Documents

.1 Submit 3 copies of as-built documents in the form specified in Section 01 32 00.

.2 In addition, submit digital scanned copy ("PDF" files) of as-built documents. Submit using digital storage medium or transfer process acceptable to the *Consultant* and the *Owner*.

1.4 Operation and Maintenance Manuals

.1 Prepare a comprehensive operation and maintenance manual, in the language of the *Contract*, using personnel qualified and experienced for this task.

.2 Submit an initial draft of the operation and maintenance manual for *Consultant's* review. If required by *Consultant's* review comments, revise manual contents and resubmit for *Consultant's* review. If required, repeat this process until *Consultant* accepts the draft manual in writing.

.3 Submit operation and maintenance manuals as follows:

.1 Submit 3 copies of operation and maintenance manuals in hard copy.

.2 In addition, submit digital copies ("PDF" files) of operation and maintenance manuals. Submit using digital storage medium or transfer process acceptable to the *Consultant* and the *Owner*.

1.5 Operation and Maintenance Manual Format

.1 Organize operation and maintenance manuals into the following general components:

.1 Operation and maintenance book.

.2 *Project* data book.

.3 Shop drawing book.

.4 Warranty book.

.2 Organize data in the form of an instructional manual.

.3 Bind each general component of the operation and maintenance books in separate vinyl hard covered, 3 ring loose leaf binders.

.4 Enclose title sheet, labelled as applicable, with project name, date and list of contents.

.5 Organize contents into applicable sections of work to parallel project *Specifications* break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.6 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.7 Cover: Identify each binder with typed or printed title "Operation and Maintenance Manual", name of *Project* or facility, and subject matter of contents.

.8 Text: Manufacturer's printed data, or typewritten data.

1.6 Operation and Maintenance Book

.1 Operation and maintenance books shall contain operating and maintenance data and information specified below for supplied *Products*.

.2 Neatly type lists and notes. Use clear drawings, diagrams of manufacturers' literature.

.3 Each Item of Equipment and Each System: include description of unit or system and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.4 Panel Board Circuit Directories: provide electrical service characteristics, controls, and communications.

.5 Include installed colour coded wiring diagrams.

.6 Description, operation and maintenance instructions for equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.

.7 Operating Procedures: include start up, break in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut down, and emergency instructions. Include summer, winter, and any special operating instructions.

.8 Maintenance Requirements: include routine procedures and guide for trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.9 Provide servicing and lubrication schedule, and list of lubricants required.

.10 Include manufacturer's printed operation and maintenance instructions.

.11 Include sequence of operation by controls manufacturer.

.12 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.13 Provide installed control diagrams by controls manufacturer.

.14 Provide *Contractor's* coordination drawings, with installed colour coded piping diagrams.

.15 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.16 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.17 Include testing and balancing reports.

.18 Include additional content as specified in technical *Specifications* sections.

1.7 *Project* Data Book

.1 *Project* Data Book shall include the following information supplemented by additional required data specified elsewhere in the *Contract Documents*:

.1 Maintenance instructions for finished surfaces and materials.

.2 Copy of hardware and paint schedules.

.3 Names, addresses and phone numbers of *Subcontractors* and *Suppliers*, as applicable.

.4 Additional material used in the *Work* listed under various sections showing name of manufacturer and source of supply.

.5 Report recording demonstration and instruction provided to *Owner* for operation and maintenance of building systems as described below in this section.

.6 Key construction photos.

.7 Permits and forms:

.1 Certificate of Clearance from the Workplace Safety and Insurance Board (WSIB).

.2 Electrical authority certificate of inspection.

1.8 Shop Drawing Book

.1 Submit one copy of each final accepted *Shop Drawings* issued for the *Work* on which have been recorded changes made during fabrication and installation caused by unforeseen conditions.

.2 Engineered *Shop Drawings* shall include copies of the certificate of insurance, the engineer's field review reports, and the engineer's letters of general conformity that were provided as part of the engineered submittal in accordance with Section 01 33 00 appended to the pertinent engineered *Shop Drawings* in the shop drawing manual.

1.9 Warranty Book

.1 Submit copies of bonds, guarantees, warranties and extended warranties together, complete with an indexed summary list of warranties and expiration dates. Warranties to be in accordance with Section 01 78 36.

.2 Separate each warranty with index tab sheets keyed to Table of Contents listing.

.3 List each warrantor with complete contact information.

.4 Verify that documents are in proper form and contain full information. Warranties shall be for the correct duration and shall be in *Owner's* name.

.5 Include maintenance bond(s).

1.10 Posted Operating Instructions

.1 Prepare operating instructions in English for posting near equipment and systems. Posted instructions to be glass covered, framed and mounted.

.2 Posted instructions to consist of simplified, consolidated equipment, control and power diagrams graphically representing the entire system, including concise instructions on how to start and stop systems, what settings and conditions are to be observed by the operators, and what control adjustments are to be made or maintained by the operator.

.3 Posted instructions shall include control diagrams with added specific operating instructions, controls, interlocks, and the like.

.4 Posted instructions shall include:

.1 HVAC controls for each system.

.2 One line schematic diagrams of water supply.

.3 One line isometric diagrams of sanitary drainage.

.4 One line diagrams of steam distribution, hot and cold water systems, including risers, valves, control devices, etc.

1.11 Spare Parts, Maintenance Materials, and Special Tools

.1 Provide overage, extra stock, and maintenance materials, including keys, in quantities specified in the *Contract Documents*.

.2 Submit to *Consultant* a typed inventory list of maintenance materials prior to application for *Substantial Performance of the Work*. List all items, complete with quantities, and storage locations. Include *Consultant* reviewed inventory listing in final submission to *Owner*.

.3 Prepare and submit a master list identifying maintenance materials and maintain a log of when materials are turned over to *Owner* and signing authority for acceptance of materials on behalf of *Owner*.

.4 Provide tags for special tools identifying their function and associated *Product*.

.5 Supply spare parts, maintenance materials, and special tools in quantities specified in technical *Specifications* sections.

.6 Ensure spare parts and maintenance materials are new, not damaged nor defective, and of same quality, manufacturer, and batch or production run as installed *Products*.

.1 Replace incorrect or damaged maintenance materials.

.7 Deliver to and store items at location and time directed by *Owner*. Store in original packaging with manufacturer's labels intact and in a manner to prevent damage or deterioration.

.1 Clearly mark cartons or packaging as to contents, project name, and *Supplier*.

.2 If applicable give colour and finish, room number or area where material is used.

.3 Include necessary information for re-ordering of materials as part of packaging of materials.

.8 Catalogue all items and submit to *Consultant* an inventory listing organized by *Specifications* section. Include *Consultant* reviewed inventory listing in operation and maintenance manual.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Extended Warranties

.1 Extended warranties shall be in accordance with GC 12.3, as amended, and as follows:

.1 Where specifically identified in the *Contract Documents*, extended warranties shall be furnished by individual manufacturer for particular product/system/assembly.

.2 Extended warranties shall include for proper performance of the portion of the *Work* as defined by the scope of the applicable *Specifications* section to the extent that the design and *Contract Documents* permit such performance.

.3 The *Owner* shall promptly give the warrantor notice in writing of observed defects and deficiencies which occur during the warranty period.

.4 Extended warranties shall commence at date of *Ready-for-Takeover*.

.5 Extended warranties specified shall be in addition to, and run concurrent with, other warranties required by the *Contract Documents*. Manufacturer's disclaimers and limitations on product warranty do not relieve *Contractor* of obligations under requirements of the *Contract Documents*.

.6 Submit extended warranty on warrantor's standard form specifically endorsed by the warrantor to the *Owner* and shall include the following information:

.1 Name and address of *Project*.

.2 Warranty commencement date.

.3 Warranty period.

.4 Specific warranty terms as required in applicable portion of *Contract Documents*.

.5 Name and title of authorized signing officer and seal of warrantor.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Systems demonstration and training.

1.2 Preparation

.1 Prior to scheduling demonstration and training:

.1 Review condition of equipment such as lighting, elevators, and heating system, which has been used in the course of the *Work* to ensure turning over at completion in "as new condition" with warranties dated and certified from time specified.

.2 When partial occupancy of uncompleted project is required by *Owner*, coordinate *Owner's* uses, requirements, access, and the like, with requirements to complete the *Work*.

1.3 Submittals

.1 Submit proposed dates, times, durations, and locations for demonstration and training of each item of equipment and each system for which demonstration and training is required. Allow sufficient time for training and demonstration for each item of equipment or system, or time as may be specified in technical *Specifications*.

.2 *Consultant* and *Owner* will review submittal and advise *Contractor* of any necessary revisions.

.3 Submit report(s) within 5 *Working Days* after completion of demonstration and training:

.1 Identifying time and date of each demonstration and training session.

.2 Summarizing the demonstration and training performed.

.3 Including a list of attendees.

1.4 Demonstration and Training

.1 Perform system demonstration work no later than 10 *Working Days* prior to submitting request for *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved.

.2 Submit required certificates of approval or acceptance from authorities having jurisdiction.

.3 Prerequisites to demonstration and training:

.1 Testing, adjusting, and balancing has been performed in accordance with *Contract Documents*.

.2 Equipment and systems are fully operational.

.3 Copy of completed operation and maintenance manual is available for use in demonstration and training.

.4 Conditions for demonstration and training comply with requirements specified in technical *Specifications*.

.4 Demonstration and training:

.1 Demonstrate and provide training to *Owner's* personnel.

.2 Instruct *Owner's* personnel in operation and maintenance of equipment and systems, using operation and maintenance data provided as the basis for instructions. Arrange and coordinate instruction of *Owner's* staff in care, maintenance, and operation of building systems and finishes

.3 *Contractor*, manufacturer's representatives, and responsible personnel from *Subcontractors* whose work is being demonstrated shall be present at these demonstrations, as well as *Owner's* personnel.

.4 *Owner* shall provide list of personnel to receive training and shall coordinate their attendance at agreed upon times.

.5 Demonstration shall include start up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment and system.

.6 Review operation and maintenance manual in detail to explain all aspects of operation and maintenance.

.7 Instruct *Owner's* representative on use of software required for operation and maintenance of building systems and provide a toll-free telephone number or website address for further assistance to the *Owner*.

.8 Prepare and insert additional data in the operation and maintenance data manuals when the need for additional data becomes apparent during demonstration or instruction.

.5 Correct deficiencies and defects identified during demonstration, instruction, or commissioning.

.6 Attend 'end-of-work' testing and break-in or start-up demonstration.

PART 2 - PRODUCTS
Not applicable.

PART 3 - EXECUTION
Not applicable.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

.1 Canadian Environmental Protection Act,1999 (CEPA 1999).

.2 Current National Fire Code of Canada.

.3 Current Transportation of Dangerous Goods Act (TDG Act).

.4 Transportation of Dangerous Goods Regulations (TDG Regulations), SOR/85-77, SOR/85-585, SOR/85-609, SOR/86-526.

.5 Storage of PCB Material Regulations, SOR/92-507.

.6 Current PCB Waste Export Regulations, SOR/97-109.

.7 Ozone-Depleting Substances Regulations, SOR/95-576.

.8 Current Environmental Code of Practice on Halons.

.9 Current Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

1.3 DEFINITIONS

.1 Toxic: For the purposes of this specification, a substance is considered toxic if it is listed on the Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists all substances that have been assessed as toxic. The federal government can make regulations with respect to a substance specified on the List of Toxic Substances. Column II of this List identifies the type of regulation applicable to each substance.

.3 PCBs: includes any chlorobiphenyls referred to in Column I of item 1 of the List of Toxic Substances in Schedule I of the Canadian Environmental Protection Act.

1.4 SUBMITTALS

.1 Product Data
- .1 Submit photocopy of shipping documents to the City when shipping toxic wastes off site.
- .2 Maintain a copy of product data in readily accessible file on site.

.2 Submission Requirements:

.1 Submit product data to the Consultant in accordance with Section 01 33 00 - Submittal Procedures.
.2 Express all weights and volumes in SI Metric units.
.3 Accompany submissions with transmittal letter containing:
  .1 Date.
  .2 Project title and number.
  .3 Contractor's name and address.
  .4 Identification and quantity of attached product data.
  .5 Other pertinent data.

1.5 STORAGE AND HANDLING

.1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

.3 Co-ordinate storage of toxic wastes with the City and abide by internal requirements for labelling and storage of wastes.

.4 Observe smoking regulations at all times. Smoking is prohibited in any area where toxic wastes are stored, used, or handled.

.5 Only certified persons who have successfully completed the Environment Canada Environmental Awareness Course for the Environmentally Safe Handling of Refrigerants are permitted to work on refrigeration and air conditioning systems.

.6 Report spills or accidents involving toxic wastes immediately to the City and to appropriate regulatory authorities. Take all reasonable measures to contain the release while ensuring health and safety is protected.

.7 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.8 Use only an authorized/licensed carrier to transport toxic waste.

.9 Co-ordinate transportation and disposal of toxic wastes with the City.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Ensure toxic waste is shipped to an authorized/licensed treatment or disposal facility and that all liability insurance requirements are met.

.3 Provide the City with certification of approved MOE part V Landfill location.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

.1 Export and Import of Hazardous Waste Regulations (EIHW Regulations), SOR/92-637.

.2 Current National Fire Code of Canada.

.3 Current Transportation of Dangerous Goods Act (TDG Act), (T-19.01).

.4 Transportation of Dangerous Goods Regulations (TDGR), (SOR/85-77, SOR/85-585, SOR/85-609, SOR/86-526).

1.3 DEFINITIONS

.1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.4 SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to the City current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to the City, that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.5 STORAGE AND HANDLING

.1 Coordinate storage of hazardous materials with the City and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use. Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the City.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.

.7 Flammable liquids having a flash point below 38°C, such as naphtha or gasoline, will not be used as solvents or cleaning agents.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.

.9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.

.10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

- .1 Store hazardous materials and wastes in closed and sealed containers which are in good condition.
- .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
- .3 Store hazardous materials and wastes in containers compatible with that material or waste.
- .4 Segregate incompatible materials and wastes.
- .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
- .6 Store hazardous materials and wastes in a secure storage area with controlled access.
- .7 Maintain a clear egress from storage area.
- .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
- .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.

.10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.11 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.12 Report spills or accidents immediately to the City. Submit a written spill report to the City within 24 hours of incident.

1.6 TRANSPORTATION

.1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Only bring on site the quantity of hazardous materials required to perform work.

.2 Maintain MSDSs in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 EXECUTION

3.1 DISPOSAL

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is an approved, cost effective recycling process available.

.3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in a timely fashion in accordance with applicable provincial regulations.

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK

.1 Section 31 05 17 – Aggregate Materials
.2 Section 31 32 21 – Geotextiles
.3 Section 32 12 17 – Asphalt Paving
.4 Section 32 13 10 – Unit Paving
.5 Section 32 13 15 – Concrete Walks, Curbs, and Gutters
.6 Section 32 37 00 – Site Furnishings

1.2 REFERENCES

.1 Concrete materials and methods of construction: to current CAN/CSA-A23.1 standards.

.2 Construct work in accordance with applicable current ASTM and ASTI standards.

.3 CAN/ULS S701-05 Thermal Insulation, Polystyrene, Boards

1.3 INSPECTION AND TESTING

.1 Obtain approval from the Consultant and/or Contract Administrator of the concrete bases or subbases before proceeding.

.2 Arrange and pay for all testing of the concrete by an independent testing agency approved by the Consultant and/or Contract Administrator. Submit all test reports of the Consultant and/or Contract Administrator in a timely manner to prevent delays to the Work.

.3 Concrete testing: to current CAN/CSA-A23.2 by testing agency designated and paid for by the City. Accelerated test methods will apply.

.4 Give the testing agency minimum 24h notice before each concrete pour.

.5 Comply with the requirements of Section 01450 - Quality Control and Testing.

.6 Conform to current CSA Standard CAN3-A23.2-M90.

.7 Concrete testing by agency appointed by the City will include:
  .1 A standard strength test for concrete placed but not less that one test for concrete placed each day. Each strength test sample will consist of three cylinders with proper identification and field data. One specimen will be tested at 7 days and 28 days. Cylinders will be field cured prior to shipping to the test laboratory.
  .2 One standard air entrainment test for each standard strength test.
  .3 One or more standard slump test with each standard strength test. The Town may require additional testing for each truck load placed, as deemed necessary.

.8 Concrete may be rejected prior to placement if:

.1 Concrete fails to conform with the specified mix design.
.2 The concrete placement does not begin within 2 hours from plant batch time.
.3 The concrete is older than 2 hours from plant batch time.
.4 The concrete has undergone less than 70 or more than 100 revolutions at the mixing speed.

.9 Concrete test compressive strength: Concrete will be considered under strength if:
.1 The average of any day's tests of each class of concrete is below specified strength.
.2 Any single test falls below 80 percent of the specified strength. In case of dispute, the Contractor may have two 100mm DIA cores from the concrete drilled and tested at their own expense, in accordance with the current CSA Standard CAN3-A23.2-M90. The results shall be applied in the manner outlined above.

.10 Concrete will be considered defective by the Consultant if it is not watertight, shows evidence of honeycombing, is improperly finished or is contrary to the drawings and details and shall be replaced by the Contractor at their own expense.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit engineer stamped shop drawings for all retaining walls, stairs, footings, and reinforced structures.

.3 Submit placing drawings prepared in accordance with plans to clearly show type, size, shape, and location of all concrete joints.

.4 Detail reinforcing steel in accordance with Manual of Standard Practice of Reinforcing Steel Institute of Ontario (RSIO).

.5 Each drawing submitted showing formwork design shall be in accordance with the current CAN/CSA-A23.1, and bearing stamp and signature of professional engineer registered or licensed in province Ontario, Canada.

1.5 QUALITY ASSURANCE

.1 The Contractor must have a minimum 10 years experience in the construction of concrete pavements and landscape concrete features of a similar nature as specified for the project.

.2 Obtain approval from the Consultant and/or Contract Administrator of site layout required for the execution of the work including grade stakes indicating finished elevations on the site, layout of all false work, reinforcing and concrete surfaces.

.3 Any work not meeting the standards of the approved sample or the specifications herein shall be corrected by the Contractor at their own expense.

.4 Do not allow concrete to be contaminated by foreign materials or hardened concrete.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Concrete work materials and measurements to conform to applicable details.

.2 Portland cement: to current CAN/CSA-A5, Type 10.

.3 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa at 28 days.

.4 Reinforcing bars: to current CAN/CSA-G30.18, Grade 400.

.5 Welded steel wire fabric: to current CSA-G30.5

.6 Waterstops: extruded ribbed PVC strips, 12 MPa tensile strength, minimum 350% elongation, minus 45°C to plus 80°C working temperature, sizes as indicated.

.7 Premoulded joint filler: bituminous impregnated fibreboard to current ASTM D 1751.

.8 Joint sealer/filler: black, cold applied, to current CAN/CGSB-19.20, Type 1.

.9 Floor hardener: non-metallic, pre-mixed.

.10 Sealer: proprietary silane water repellant penetrating sealer.

.11 Rink Sealer: two-component polysulphide sealant

.12 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel, insulation filled.

.13 Non-shrink grout: premixed compound consisting of metallic aggregate, cement, water, reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 45 Mpa at 28 days.

.14 Dry pack: premixed of non premixed composition of non metallic aggregate, cement and sufficient water for the mixture to retain its shape when made into a ball of hand and capable of developing compression strength of 32 Mpa at 28 days.

.15 All other concrete materials: to current CAN/CSA-A23.1.

.16 Insulation:
.1 100mm High Load-100 Styrofoam (2 layers of 50mm) along CIP concrete island rink wall.

2.1 CONCRETE MIXES

.1 The proportions and qualities of cement, water and aggregate shall conform to the CSA Specifications A23.1-M, latest revision, for "READY MIX CONCRETE".

.2 Concrete shall be supplied from a Ready Mixed Concrete Supplier certified by the "Ready Mixed Concrete Association of Ontario" to the following minimum requirements:

.1 Concrete Mix 01 – for all pathways, curbs, furniture pads, and rink
.1 Compressive Strength: 32 Mpa in 28 days.
.2 Cement Content: 335 kg/m³.
.3 Exposure: Class C2.
.4 Water/Cement Ratio: 0.45.
.5 Maximum size of aggregates: 20mm.
.6 Maximum slump: 80 mm +/-10 mm
.7 Air Entrainment: 5% to 8%.

.2 Concrete Mix 02 – for all walls and stairs
.1 Compressive Strength: 35 MPa in 28 days.
.2 Cement Content: 335 kg/m³.
.3 Exposure: Class C1.
.4 Water/Cement Ratio: 0.40.
.5 Maximum size of aggregates: 10mm.
.6 Maximum slump: 80 mm +/- 20 mm
.7 Air Entrainment: 6% to 9%

.3 The City and/or Consultant reserves the right to take whatever corrective action is needed if the concrete fails to meet the requirements of this specification or shows defects after placing. The Contractor shall facilitate any needed investigation or inspection of the work.

2.2 MIX PROPORTIONS

.1 Method: Alternative 1 of current CAN/CSA-A23.1.

.2 Cement type: as specified under 2.1.

.3 Minimum 28 day compressive strengths and exposure classifications:
.1 Pavements, walks, curbs, rink, and exposed site concrete: 32 MPa; C-2.
.2 Walls and stairs: 35 MPa; C-1
.3 All other concrete: 25 MPa; C-4.

.4 Nominal size of coarse aggregate: Clause14 of current CAN/CSA-A23.1.

.5 Slump: to Table 6 of current CAN/CSA-A23.1.

.6 Air content: all concrete to contain purposely entrained air in accordance with Table10 of current CAN/CSA-A23.1.

.7 Admixtures: to Clause 6 of current CAN/CSA-A23.1.

.8 Polypropylene fibres: add 1 kg/m ^{3}, at plant, with minimum 7 minutes mixing time.

PART 3 EXECUTION

3.1 WORKMANSHIP

.1 Obtain City and/or Consultant approval before placing concrete.

.2 Place concrete in accordance with current CAN3-A23.1-M90.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Obtain City and/or Consultant approval of proposed method for protection of concrete during placing and curing in adverse weather, prior to placing of concrete.

.5 Maintain accurate records of cast-in-place concrete items to indicate date, location of pour, air temperature and test samples taken.

3.2 INSTALLATION

.1 Backfilling: Backfill the underside of the curbs, walls, etc. compacted to 98% Standard Proctor Maximum Dry Density, as detailed.

.2 Placing Formwork: design, fabrication, erection and use of concrete formwork shall conform to the current requirements of CSA Standard S269.3.

.3 Forms shall be constructed with temporary ports or openings at the bottom of all deep units such as columns and walls to facilitate cleaning and inspection.

.4 For treated formwork surfaces the materials used as a parting agent shall be non-staining. The amount of material used shall be kept to a minimum and any that adheres to reinforcing steel shall be removed. When the concrete surfaces are to receive a permanent finish coating, the parting agent shall be compatible with the coating.

.5 Prior to placing concrete, a suitable means for checking the alignment and elevations of forms during placing shall be provided. These checks shall be made frequently during the placing of the concrete, and adjustments to the formwork and falsework made as required until all concrete is in place.

.6 Forms where used shall remain in place at least 8 hours after the concrete has been placed against them. Where the air temperature drops below 10°C at any time during the 8 hour period the forms shall be left in place for such additional time as is necessary to prevent damage to the edges. Curing of the exposed concrete shall begin immediately upon removal of the forms.

.7 Refrigerated concrete rink to be placed in one continuous pour with no saw-cut joints/ control joints in slab.

.8 Placing Joints: Crack-control joints shall be cut within 24 hours using power-driven abrasive or diamond blades. Cutting of joints shall begin as soon as the cut is made and before shrinkage cracks form in the concrete.
- .1 The depth of the control joints shall be between a quarter and a third of the thickness of the slab or wall.
- .2 Control of construction joints to the surface plane, as shown on drawings.
- .3 Maximum interval not to exceed 2 metres.
- .4 Placing Expansion Joint: material should be placed to full depth to isolate any rigid structure encountered in the line of the work, and place expansion joints to the full depth of the concrete curb at a maximum of 6 metres spacing.

.9 Placing Concrete: All concrete shall be placed under the following conditions:
- .1 Each load shall have correct air content.
- .2 Slump tests shall be taken on the first load of concrete arriving on the job site, and thereafter at the discretion of the City and/ or Consultant.
- .3 In dry forms accepted by the Testing Agency.
- .4 As near as possible to its final position.
- .5 Maximum vertical drop from chutes shall be 1.5m.
- .6 Evenly on both sides of the expansion joints so as to retain their vertical position.
- .7 Forms shall be filled with an excess of concrete thoroughly spaded, compacted and struck off to its required level in such a manner as to force the coarse aggregate below the surface of the mortar.
- .8 Air temperature shall be 5ºC and rising, and all necessary precautions shall be taken during cold weather.
- .9 No concrete shall be placed on frozen ground.
- .10 Concrete shall have a temperature of no less than 10ºC and no more than 38ºC at the time of the placing, and means acceptable to the Testing Agency shall be provided to maintain these limits for 72 hours after placing.
- .11 Concrete shall be continuously vibrated (formwork or internal) during placement to eliminate all air pockets and ensure sufficient coverage throughout formwork.

.10 Concrete Finishing and Form Stripping: The formwork may be stripped after initial set of the concrete has been achieved.

.11 On exposed formed surfaces, neatly chip off fins, unsightly ridges or other imperfections; fill small surface voids with grout and rub flush with the general surfaces.

.12 Rub exposed sharp edges of concrete with Carborundum to produce 3mm radiused edges unless otherwise detailed.

.13 Slope surfaces as indicated on plan.

3.3 INSERTS

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100mm x 100mm not indicated, must be approved by the City and/or Consultant.

3.4 CURING

.1 Concrete surfaces shall be cured for 3 days at a minimum temperature of 10°C or for the time necessary to attain 35% of the specified 28 day compressive strength of the concrete.

.2 Concrete shall be cured by the installation of a curing compound of polyethylene vapour barrier ensuring complete coverage of the concrete.

3.5 COLD WEATHER WORK

.1 Take cold weather precautions whenever the ambient temperature is, or is expected to be, at or below 5 °C.

.2 Have protective measures in place, or adjacent to the work before any concrete is mixed or ordered.

.3 Maintain concrete temperature between 10°C and 20°C for a minimum of 3 days for unloaded areas, and 6 days for areas receiving partial load. These durations may be reduced by 33% with the use of high early strength cement.

.4 In methods employed to maintain the concrete temperature, provide suitable access for inspection.

3.6 FINISHES

.1 All exposed vertical surfaces of concrete to be architectural grade with a totally smooth, free of air pockets, stains, roughness, chipped corners, etc.

.2 Pavements, walks, walls, curbs, rink, and exposed site concrete: screed to plane surfaces and float using aluminum, magnesium, or wood floats. Round edges and provide joint spacings using standard tools. Trowel smooth followed by sandblast non-slip finish.

- .1 Surfaces shall be blasted using abrasive achieving an even and uniform exposure of aggregate.
- .2 Sandblasted surfaces shall have uniform depth of cut-back, distribution of aggregate and colour and texture matching the sample accepted by the Consultant.
- .3 Individual concrete members shall be sandblasted at the same age to ensure reasonable colour uniformity.

.3 Municipal Sidewalk: Match existing sidewalk condition as per City Standard.

3.7 CONTROL JOINTS

.1 Cut or form control joints in slabs on grade at locations indicated, in accordance with current CAN/CSA-A23.1. Fill with specified joint sealer/filler.

3.8 EXPANSION AND ISOLATION JOINTS

.1 Install pre-moulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.

.2 Caulk joints as indicated on drawings.

.3 Watertight joint surrounding rink:
Product: DSM System Joint
Supplier: Emseal Joint System Ltd. (or approved equal)

3.9 CURING

.1 Cure and protect concrete in accordance with current CAN/CSA-A23.1, except that curing compounds shall not be used where bond is required by subsequent topping or coating.

3.10 GROUT

.1 Grout voids under baseplates.

.2 Grout into place, bolts and other items of concrete hardware, that are not placed prior to pouring concrete.

.3 Mix and place grout.

3.11 SEALING

.1 Following curing, apply silane water repellant penetrating sealer treatment to exposed surfaces.

.2 Apply silane water repellant penetrating sealer per manufacturer's instructions.

.3 Rink Slab: two-component polysulphide sealant applied according to manufacturer's instructions.
.1 Deck-O-Seal by WR Meadows
.2 Primer – as recommended by sealant manufacturer
.3 Bond breaker – an inert film such as polyethylene sheet or masking tape

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Concrete floor finishing, including:

.1 Membrane forming curing compound.

.2 Saw-cut contraction (control) joints in concrete slabs on grade.

.3 Contraction (control) joint filler.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Reports:

.1 Submit log records of measurements for f-number concrete finish tolerance.

1.3 Quality Assurance

.1 Qualifications:

.1 *Subcontractor*:

.1 Has adequate equipment and skilled workers to perform the work expeditiously.

.2 Has successfully completed installations similar to that specified.

PART 2 - PRODUCTS

2.1 Materials

.1 Membrane forming curing compound:

.1 Exterior grade, styrene-acrylic polymers and quick evaporating solvents, transparent, to ASTM C309-19, Type 1, Classes A & B, VOC-compliant with VOC content limits of 700 g/L.

.2 Acceptable *Products*:

.1 W.R. Meadows Inc. 'SEAL CURE-309-30'.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Contraction (control) joint filler; concrete slabs on grade (non-elastomeric):

.1 Shore A hardness of 80, self-levelling, 2-component odourless polyurea, rapid curing, and suitable for vehicular traffic, non-elastomeric semi-rigid.

.2 Acceptable *Products*:

.1 Ardex 'Ardiseal Rapid Plus'.

.2 Master Builders Solutions 'MasterSeal CR 100'.

.3 Sika Canada Inc. 'Loadflex-524 EZ'.

.4 The Euclid Chemical Company 'EUCO QWIKjoint 200'.

.5 Substitutions: in accordance with Section 01 25 00.

PART 3- EXECUTION

3.1 Concrete Slab Finishing

.1 General:

.1 Comply with concrete slab surface finishing tolerances schedule specified in this section.

.2 Strike off concrete level to screeds leaving no low spots. If vibrators are used on straightedge, ensure that concrete is not over-vibrated causing segregation and collection of water and fines on the surface.

.3 Smooth concrete to an even plane with a darby or bull float, and leave until bleed water and water sheen has disappeared.

.4 Proceed with finishing only when concrete has hardened sufficiently.

.5 Finish exposed edges of concrete surfaces smooth with an edging tool, with slightly round exposed corners.

.6 Finish concrete surface with power float or with metal hand floats in areas inaccessible to power floats. Floating shall embed large aggregate below surface, consolidate mortar at surface, with even planes, without humps or depressions, remove marks from edging, and prepare surface for further specified finishing. Do not bring water and fine material to surface by overworking.

.7 Steel trowel floated surface with power trowels or hand trowels in areas inaccessible to power trowels. Proceed with trowelling only when there is no sheen on surface. Repeat trowelling until surface is brought to approved finish. Allow sufficient time between trowelling for additional set of concrete.

.8 Rerun tooled edges following finishing of surfaces.

.9 Finish floor surfaces level, dense, with no aggregate showing, and free of blemishes and crazing.

.2 Scratch finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 6 mm (1/4") in 1 direction.

.1 Apply scratch finish to surfaces to receive concrete floor toppings.

.2 Apply scratch finish to surfaces to thick set mortar setting beds for bonded floor finishes at depressed slab locations.

.3 Float finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

.1 Apply float finish to concrete surfaces to receive trowel finishes and membrane finishes.

.4 Trowel finish: After applying float finish, apply first trowelling and consolidate concrete by hand or power-driven trowel. Continue trowelling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

.1 Apply trowel finish to surfaces unless otherwise indicated or scheduled.

.5 Broom finish: Immediately after float finishing, slightly roughen trafficked surface by brooming with fibre-bristle broom perpendicular to main traffic route. Coordinate required final finish with *Consultant* before application.

3.2 Concrete Slab Surface Finishing Tolerances

.1 Concrete tolerances: F-number in accordance with CAN/CSA A23.1/A23.2-14.

.1 Level surface to the following minimum tolerance. Grind smooth surface defects that would be visible or telegraph through applied floor finishing system.

.1 Class B: F_F 25 - F_L 20.

.2 Measure f-number finish tolerance requirements in accordance with CAN/CSA A23.1/A23.2-14.

.3 Independent testing company shall measure for *F*-number finish tolerance requirements in accordance with CAN/CSA A23.1/A23.2-14, in accordance with Section 01 45 00. Provide 4 *Working Days* notice in advance of concrete flooring placement and finishing.

3.3 Membrane Forming Curing Compound Installation

.1 Install in accordance with manufacturer's written requirements.

.2 Apply curing-sealing compound to new concrete as soon as the concrete is firm enough to work on after trowelling.

.3 Spray on in a fine, fog pattern without spurts and dribbles to form a thin, continuous film. Avoid puddles in low areas and if puddles occur, brush or roll them out.

.4 Apply 2 coats of curing-sealing compound at right angles. Apply second coat immediately prior to date of *Substantial Performance of the Work*.

3.4 Contraction (Control) Joints

.1 Install contraction (control) joints in accordance with CAN/CSA A23.1/A23.2-14.

.2 Contraction (control) joint filler:

.1 Clean side surfaces of joints to remove dirt, debris, saw-cuttings, oil, grease, and similar contaminants.

.2 Install non-elastomeric filler materials for the full depth of the saw-cut in accordance with manufacturer's written requirements.

.3 Commence filling after sufficient curing and drying time in consultation with the materials manufacturers to prevent debonding of the filler materials due to continued drying shrinkage of the concrete and not sooner than 120 days after concrete placement.

.4 Install non-elastomeric filler materials fill joints to within 12.7 mm (1/2") of joint top and within 15 minutes of prior application, overfill joints to a slightly crowned excess. Shave-off excess control joint filler material to level control joint filler with floor slab finish.

.5 Fill joints in freezers after the temperature of the concrete has been reduced to operating temperature to avoid debonding caused by thermal contraction.

.6 Finish cured filler materials flush with the floor surface to protect the joint edges and to re-create an interruption-free floor surface.

3.5 Patching and Refinishing

.1 Before completion of the *Work*, patch and refinish defective surfaces to match surrounding areas with no discernible variation in appearance.

3.6 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

3.7 Protection

.1 Protect finished concrete floor areas from abrasion traffic, and from damage caused by spillage of oil or other deleterious materials.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Precast concrete fabrications, complete with drips, to profiles as indicated.

.2 Steel inserts and anchors for precast installation.

1.2 References

.1 Definitions:

.1 Hairline cracks:

.1 Surface cracks of minute width, visible but not measurable by ordinary means.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit shop drawings for benches.

.4 Samples:

.1 Submit precast concrete samples, in sizes as directed by the *Consultant* of the specified finish for review by the *Consultant*.

1.4 Quality Assurance

.1 Qualifications:

.1 *Subcontractor*:

.1 The work of this section shall be executed only by a *Subcontractor* with proven experience in the design and manufacture of precast concrete and having adequate finances, equipment, plant and skilled personnel to expeditiously detail, fabricate and install the work of this section as required by the *Contract Documents*.

.2 Manufacturer:

.1 Manufacturer shall be qualified in accordance with CSA A23.4-16(R2021).

.2 The manufacturer shall be responsible for the design, connections, and installation of the precast concrete units.

1.5 Delivery, Storage, and Handling

.1 Design and cast lifting devices into the units to ensure that they will be safely and efficiently handled. Lifting devices shall be so arranged that they do not have to be removed or, if they must be removed, they shall be arranged so that they are readily filled.

.2 Stack units on properly cushioned supports to protect the edges.

.3 Do not permit units to contact earth or other staining influences or to rest on corners.

.4 Protect stockpiles against inclement weather.

.5 Protect holes and reglets against water and ice in freezing weather.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Design and construct precast concrete work in accordance with CSA A23.4-16(R2021).

.2 Slope top surfaces of exterior precast minimum 2%.

.3 Provide drip section to bottom edge of exterior precast to break drainage water flow.

2.2 Materials

.1 Precast concrete units:

.1 Cement, water reducer, air entrainment, sand, aggregates, water admixture: to CSA A23.4-16(R2021) and CAN/CSA A23.1/A23.2-14.

.2 Aggregate: in conformance with CSA-A23.1-14 and shall be tested for soundness prior to manufacture in accordance with CSA A23.4-16(R2021).

.3 Sand: Silica or sandstone sand of approved source, as selected by *Consultant*.

.4 Admixture: in accordance with CSA-A23.1-14. Introduce admixtures to concrete at time of batching in accordance with the manufacturer's recommendations. Admixtures shall be subject to the approval of the *Consultant*.

.5 Reinforcing steel: billet steel bars conforming to CAN/CSA G30.18-09. Reinforcing larger than 6 mm (1/4") diameter shall be deformed bars conforming to the same standard. Welded wire mesh shall conform to ASTM A1064/A1064-18a. Galvanize reinforcing with less than 25 mm (1") cover.

.6 Metal precast anchor and hardware finish: hot dip galvanizing to ASTM A123/A123M-13 unless otherwise indicated. Paint welds and damaged areas of galvanized with zinc-rich touch-up paint before and after erection.

.7 Water: in accordance with CSA-A23.1-14.

.8 Concrete: minimum compressive strength of 35 MPa at twenty eight (28) days. Precast concrete units shall contain entrained air controlled at 5% minimum.

.9 Forms: constructed of approved concrete, steel or fibreglass reinforced plastic or high density overlaid plywood conforming to CSA O121-08 to obtain a high quality of the finish.

.10 Stainless steel setting rods, sized as required to receive parapet caps and sills.

.11 Non-shrink grout and setting mortar: Non-shrink 2-component setting type epoxy mortar as manufactured by Sika, WR Meadows, Master Builders Solutions, or approved alternative.

.2 Finish on exposed surfaces of precast concrete shall be grey or white, to *Consultant's* selection, with smooth finish and as follows:

.1 Colour and texture: CPCI finish code CPCI-101.

PART 3 - EXECUTION

3.1 Installation

.1 Erect precast concrete units in accordance with CSA A23.4-16(R2021) and this Standard shall apply to precast concrete units required under this section.

.2 Set work plumb, true and square with joints parallel and uniform. Vertical and horizontal joints 12.7 mm (1/2") wide maximum as detailed.

.3 Where tolerances will interfere with work of other Sections that will force other work to be out of plumb or deviate from straight lines shown on drawings, provide remedial work for this defect at no additional cost to the *Owner*.

.4 Set dowels into full contact with non-shrink grout in accordance with shop drawings.

.5 Set precast into full contact with non-shrink mortar in accordance with shop drawings.

.6 Joints between precast and between precast and adjacent materials: Apply sealant in accordance with Section 07 92 00.

.7 Supply adequate information on handling and installation methods.

3.2 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Rejection of work:

.1 Concrete units containing concrete which have failed to meet required strength requirements will be rejected. Units fabricated out-of-square, out-of-dimension, without proper reinforcement, proper opening or inserts, shall be rejected.

.2 Damaged, chipped, rust stained, and discoloured panels shall be replaced, patched or refinished with original face matrix materials.

.3 Except for hairline cracks, units which have become cracked or broken will be rejected.

3.3 Adjusting and Cleaning

.1 Remove, as work progresses, excess or foreign materials that would set on or become difficult to remove from finished surface.

.2 At completion, clean exposed surfaces of precast units. Remove dirt and other extraneous matter. Do not use acidic cleaners.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Concrete unit masonry assemblies.

.2 Concrete masonry unit veneer wall assemblies.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19 and as follows:

.1 *Subcontractors* are required to attend the pre-installation meeting in addition to the *Subcontractor* for the work of this section shall include *Subcontractors* responsible for air barriers, siding/roofing, and glazing systems.

.2 Manufacturer's representatives are required to attend the pre-installation meeting include those representing mortar, masonry units, and masonry reinforcing and connectors.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit shop drawings for masonry unit wall assemblies indicating:

.1 Proposed locations of movement (control) joints.

.2 Types of masonry units, grade, typical dimensions, special shapes and shape dimensions.

.3 Layout/coursing for each type of masonry unit.

.4 Samples:

.1 2 of each type of concrete masonry unit specified.

.2 2 of each type of architectural concrete masonry unit specified including corner units and in varying degrees of "roughness" or texture.

.3 1 of each type of masonry accessory specified.

.4 1 of each type of masonry reinforcement proposed for use.

.5 Test and evaluation reports: Submit test results confirming compliance of aggregates with CAN/CSA A179-14.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Installers: Minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.2 Aspects of the work of this section are required to be prepared by a professional engineer. Refer to Section 01 33 00 for specific details and requirements in this regard.

.2 Mock-ups:

.1 Provide mock-ups in accordance with Section 01 45 00, sizes as directed by *Consultant*.

.2 Construct mock-up of concrete masonry partition assemblies.

.3 Construct mock-up of concrete masonry veneer wall assemblies.

.4 Accepted mock-ups may remain as part of the final work.

1.5 Field Conditions

.1 Cold weather construction requirements:

.1 Comply with requirements of CAN/CSA A371-14, and as follows:

Air Temperature, °C	General requirements during construction
0 to 4	Sand or mixing water shall be heated to a minimum of 20°C and a maximum of 70°C.
-4 to 0	Sand and mixing water shall be heated to a minimum of 20°C and a maximum of 70°C.
-7 to -4	(1) Sand and mixing water shall be heated to a minimum of 20°C and a maximum of 70°C. (2) Source heat shall be provided on both sides of the walls under construction. (3) Windbreaks shall be employed when the wind speed exceeds 25 km/h.
-7 and below	(1) Sand and mixing water shall be heated to a minimum of 20°C and a maximum of 70°C. (2) Enclosures and supplementary heat shall be provided to maintain an air temperature above 0°C. (3) The temperature of the unit when laid shall be not less than 7°C.

.2 Place grout in masonry at a minimum temperature of 20°C and a maximum temperature of 50°C.

.3 Mortar temperature shall not exceed 50°C to avoid flash set.

.4 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.

.2 Cold weather protection requirements:

.1 Comply with requirements of CAN/CSA A371-14, and provide protection requirements for completed masonry or sections not in progress shall be as follows:

Mean daily air temperature, °C	Protection
0 to 4	Masonry shall be protected from rain or snow for 48 h
-4 to 0	Masonry shall be completely covered for 48 h
-7 to -4	Masonry shall be completely covered with insulating blankets for 48 h

-7 and below	The masonry temperature shall be maintained above 0 °C for 48 h by enclosure and supplementary heat

.3 Hot weather construction requirements:

.1 Comply with requirements of CAN/CSA A371-14, and as follows:

.1 Limit spreading of mortar beds to 1.2 m, and set masonry units within 1 minute of spreading the mortar, when the air temperature is above:

.1 38°C; or

.2 32°C, with a wind velocity greater than 13 km/h.

.2 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

PART 2 - PRODUCTS

2.1 Mortar Materials

.1 Mortar: CAN/CSA A179-14.

.2 Portland cement:

.1 CAN/CSA A3001-13, GU (Type 10)/ASTM C150/C150M-21.

.2 For exposed mortar: maintain uniformity of cement manufacturer and batch for colour uniformity.

.3 Hydrated lime: ASTM C207-18, Type S.

.4 Sand: CAN/CSA A179-14.

.5 Maintain uniformity of mortar material manufacturers, mortar materials and source of aggregate throughout the *Work*.

.6 Mortar types:

.1 Foundation walls and other exterior masonry at or below grade: Type S.

.2 Exterior masonry above grade:

.1 Loadbearing: Type S.

.2 Non-loadbearing: Type N.

.3 Mortar for exterior exposed masonry veneer: Type N, Portland Cement/Lime/Sand mix.

.3 Interior masonry:

.1 Loadbearing: Type S.

.2 Non-loadbearing: Type N.

.4 Mortar colour: Grey.

2.2 Grout

.1 Grout following masonry components:

.1 Lintels and bond beams.

.2 Grouted walls and piers.

.2 Place and grout reinforcing and bearing in accordance with CAN/CSA A371-14 and structural drawings. Use concrete of minimum 20 MPa compressive strength unless otherwise indicated.

.3 Grout for block cores: CAN/CSA A179-14.

2.3 Reinforcing and Connectors

.1 Conform to minimum requirements of CAN/CSA A370-14 unless otherwise indicated, and to requirements for seismic reinforcement of partition walls as indicated on the drawings.

.2 Corrosion protection; metal materials: in accordance with building code and CAN/CSA A370-14:

.1 Hot dipped after fabrication to ASTM A1064/A1064-18a, and ASTM A153/A153M-09 Class B2 (457 g/m^2).

.1 Exterior to air barrier location: Use hot dip galvanized after fabrication.

.2 Interior to air barrier location: Use mill galvanized.

.2 For metal located exterior to the air barrier membrane: Stainless steel Type 304/316.

.3 Joint reinforcement:

.1 Acceptable manufacturers:

.1 Blok-Lok.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Exterior wall assemblies: 4.75 mm (3/16") wire, welded rod, ladder design unless otherwise indicated.

.3 Interior wall assemblies: 9 gauge mill galvanized wire ladder reinforcement.

2.4 Masonry Accessories

.1 Deflection space filler (non-fire rated walls):

.1 Acceptable *Products*:

.1 Johns Manville 'MinWool Sound Attenuation Fire Batts'.

.2 Rockwool 'AFB'.

.3 Substitutions: in accordance with Section 01 25 00.

.2 Deflection space filler (fire rated walls): in accordance with Section 07 84 00.

.3 Movement (control) joint filler; concrete block wythes: PVC, designed to fit into sash grooves.

.1 Acceptable *Products*:

.1 Blok-Lok 'VS Series'.

.2 Substitutions: in accordance with Section 01 25 00.

.4 Slip-sheet flashing membrane (for lintel bearing locations):

.1 Minimum 0.5 mm (0.020") thick, PVC membrane, low temperature flexible to 40°C below zero.

.2 Acceptable *Products*:

.1 Blok-Lok 'Flex-Flash'.

.2 Lexcor F20.

.3 Substitutions: in accordance with Section 01 25 00.

.5 Masonry flashing: air barrier flashing membrane in accordance with Section 07 27 00, full width (roll) to suit conditions at the *Place of the Work*.

.6 Metal flashing:

.1 0.457 mm (26 gauge SWG) minimum thickness, commercial quality to ASTM A653/A653M-13 with Z275 designation zinc coating, CSSBI 10000 Series baked enamel finish, standard colour as selected by *Consultant*.

.2 Lap sealant:

.1 Acceptable Product:

.1 Bakor 'Air-bloc-21'.

.2 Substitutions: in accordance with Section 01 25 00.

.7 Expansion strips: polyethylene foam, 10 mm (3/8") thick.

2.5 Concrete Masonry Units

.1 CAN/CSA A165 SERIES-14.

.2 Include shapes, such as end, bond, sash groove, ledge and lintel units, required to complete the *Work*, with uniform appearance.

.1 Provide open end blocks where vertical reinforcing occurs in walls.

.2 Provide knock-out blocks where horizontal reinforcing bars occur in walls.

.3 Provide bullnose units at interior partition outside corners and where indicated.

.4 Solid concrete masonry units may be used where grouted block is indicated, whenever reinforcing is not indicated, in lieu of grouted solid installation method.

.5 Size: metric.

.3 Normal weight units:

.1 Hollow units: H/15/A/M, H/20/A/M and H/25/A/M.

.2 Semi-solid units: SS/15/A/M, SS/20/A/M and SS/25/A/M.

.3 Full solid units: SF/15/A/M, SF/20/A/M and SF/25/A/M.

.4 Colour: grey.

.5 Profiles: as indicated.

.4 Light weight units:

.1 Hollow units: H/15/C/M.

.2 Semi-solid units: SS/15/C/M.

.3 Full solid units: SF/15/C/M.

.4 Colour: grey.

.5 Profiles: as indicated.

.5 Masonry veneer units: CAN/CSA A165 SERIES-04:

.1 Size: 90 mm x 590 mm x 90 mm (3-1/2" x 23-1/4" x 3-1/2").

.2 Colour: Peel Silver.

.3 Finish: Suave.

.4 Integral water repellent additive and mortar treatment: masonry unit manufacturer's standard product.

.5 Acceptable Products:

.1 Brampton Brick 'Profile Series'.

PART 3 - EXECUTION

3.1 Preparation

.1 Prior to commencing masonry work, verify that conditions at the *Place of the Work* will allow construction of masonry within required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.

.2 Provide protection where required at mixing areas to prevent damage attributed to mortar materials.

3.2 Workmanship

.1 Build masonry plumb, level, and true to line, with vertical joints in proper alignment. Lay masonry to tolerances specified in CAN/CSA A371-14.

.2 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

.3 Masonry mortar and grout work: in accordance with CAN/CSA A179-14 except where specified otherwise.

.4 Masonry work: in accordance with CSA S304-14, CAN/CSA A370-14, and CAN/CSA A371-14 except where specified otherwise.

3.3 Measurement and Mixing

.1 Mix mortars as specified in CAN/CSA A179-14. Use only dry aggregate. Test for bulking to determine accurate proportioning.

.2 Fine grout: mix one part Portland cement and three parts sand with water.

.3 Coarse grout: ready mixed high slump pea gravel concrete.

.4 Adjust water in mortar mix to suit absorption rates of masonry units.

3.4 Laying Masonry Units

.1 Lay concrete masonry units in third running bond unless otherwise indicated.

.2 Installation and materials shall meet or exceed that of accepted samples and mock-up.

.3 Units shall be cut only upon acceptance of *Consultant*. Walls are to be laid-up with full size masonry units.

.4 Where masonry surfaces serve as substrate for thin-set tile and direct applied coatings, build to tolerance of 1:500 (1/8" in any 6'-0") (3 mm in any 1.83 m) under a straight edge.

.5 Remove loose and foreign materials from supporting bed surfaces to ensure bonding.

.6 Stop off horizontal runs of walls by racking back a half unit in each horizontal course. Do not tooth.

.7 Do not install defective, cracked, and broken masonry units.

.8 Do not install masonry units with face or faces exhibiting chips, blemishes, texture variation, and other imperfections detracting from appearance when viewed from distance of 4600 mm (15 ft.).

.9 Do not lay concrete masonry units that will appear smooth or slick where exposed to view, whether painted or not finished.

.10 Mixing and blending: Mix units from a minimum of 3 pallets to achieve uniform blend of colour and texture and comply with manufacturer's recommended installation requirements. Distribute masonry units of varying textures to avoid spotty appearance over wall surfaces exposed to view. Do not use units which contrast too greatly with overall range.

.11 Maintain bracing of walls and piers continuously during construction until structure provides support.

.12 Locate bearings and piers as indicated. Provide solid masonry units at bearings. Grout under bearing plates installed on masonry with non-shrink grout.

.13 Extend walls and partitions to deck, slab or structural members, as applicable, except where otherwise noted in the *Contract Documents*. Incorporate both lateral support and deflection space at termination of walls as required by this section.

.14 Lay masonry level, true to line, square, plumb, and as indicated. Lay masonry courses in vertical alignment to ensure vertical joints align for full height of masonry and full height of building face.

.15 Lay masonry in full bed of mortar, properly jointed with other work. Buttering corners of joints, and deep or excessive furrowing of mortar joints are not permitted.

.16 Fully bond intersections, and external corners.

.17 Do not adjust masonry units after laying. Where resetting of masonry is required, remove, clean units and reset in new mortar.

.18 Extend masonry to construction above, except where otherwise indicated. Cut and fill around obstructions.

.19 Build chases, do not cut them.

.20 Lay hollow concrete masonry units so that shell rest and align.

.21 Exposed cuts shall be made clean and true with a suitable masonry saw.

.22 Exposed corners at interior partitions shall use units with bullnose corners. At exterior exposed corners, extent of bullnose to be as indicated.

3.5 Jointing

.1 Form tooled mortar joints whenever exposed to view, and behind cabinets, fitments, and wall accessories. Tool when mortar is thumb-print hard by tools having long bearing surface to avoid uneven depressions. Close cracks and crevices.

.2 Concealed masonry: strike flush joints concealed in walls and joints in walls to receive plaster, acrylic stucco, tile, insulation, resilient base, or other applied material except paint or similar thin finish coating. Ensure that no mortar protrudes from joints on wall surfaces to receive materials and coatings.

.3 Tool with round non-staining pointing tool to provide smooth, compressed, uniformly concave joints except if specified or shown otherwise.

.4 Joint thickness:

.1 Maintain mortar joint thickness of 10 mm (3/8"), unless otherwise specified or indicated.

.2 At masonry cut around obstructions: maximum joint size of 13 mm (1/2").

.5 Make joints of uniform thickness with vertical joints in alignment.

.6 Trowel point joints in unparged masonry in contact with earth.

.7 Form reglets where indicated for metal flashing in masonry.

.8 Remove loose or defective mortar when masonry is removed and replace.

.9 Rake out joints at junctions of masonry with concrete walls and columns, and at intersection of masonry walls and partitions where joint reinforcement is installed. Seal these joints by Section 07 92 00.

.10 Cut out defective mortar joints and repoint.

3.6 Joining of Work

.1 Where necessary to temporarily stop horizontal runs of masonry, and in building corners;

.1 Step-back masonry diagonally to lowest course previously placed.

.2 Do not "tooth" new masonry.

.3 Fill in adjacent courses before heights of stepped masonry reach 1220 mm (48").

3.7 Cutting

.1 Cut out neatly using a wet diamond blade saw for electrical switches, outlet boxes, and other recessed or built-in objects.

.2 Make cuts straight, clean, and free from uneven edges.

3.8 Built-In Work

.1 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.

.2 Coordinate and cooperate in the provisions for setting, anchorage and alignment of built-in work.

.3 Metal door frames:

.1 Build masonry around metal door frames supplied and set in accordance with the various parts of the *Contract Documents*.

.2 Secure anchors solidly, and verify that frames are true and plumb.

.3 Fill back void of frames with mortar unless otherwise indicated.

.4 Protect frame with protective covering and leave no mortar on exposed frame faces.

3.9 Support of Loads

.1 Use 20 MPa concrete in accordance with Section 03 30 00, where concrete fill is used in lieu of solid units.

.2 Install building paper below voids to be filled with concrete; keep paper 25 mm (1") back from faces of units.

3.10 Reinforced Masonry

.1 Conform to requirements of CAN/CSA A371-14.

.2 Grouting beneath bearing plates: Completely fill voids beneath steel bases bearing on masonry with an approved non-shrink grout having a compressive strength at 28 days of at least 35 MPa. Where grout is exposed to view or weather, use non-ferrous expansion agents.

.3 Reinforced block lintels:

.1 Install reinforced block lintels over doorways, other openings and recesses as indicated.

.2 Support masonry units of reinforced block lintels built in place. Provide a level platform, true to the proper elevation and of sufficient strength to support the load without visible deflection. Maintain supports in place for a minimum of 7 days and for a period sufficient to permit the concrete to cure and gain sufficient strength to safely support all loads.

.4 Lay masonry units with full mortar coverage on all abutting edges with joints shoved tight. Where masonry construction is continued above the lintel, place the first course of masonry units on the lintel in a full mortar bed.

.5 Reinforce masonry lintels and bond beams as indicated. Make joints in lintels and bond beams to match adjacent walls.

.6 Reinforce masonry walls as indicated.

.7 Grouted reinforced masonry: Construct masonry to meet indicated requirements.

.8 Place 100% solid block at each jamb under lintels.

3.11 Provision for Movement

.1 Deflection space:

.1 Incorporate deflection space between tops of non-load-bearing walls/partitions and structure to prevent transference of structural loads to masonry.

.1 Exterior masonry wall deflection space: 12.7 mm (1/2").

.2 Interior masonry partition deflection space: 25 mm (1").

.2 Coordinate work of this section with installation of lateral supports.

3.12 Deflection Space Filler

.1 Non-fire rated walls: Fill deflection space with deflection space filler. Where deflection space is exposed, tamp filler into deflection space 25 mm (1").

.2 Fire-rated walls: Refer to requirements of Section 07 84 00.

3.13 Masonry Flashing

.1 Install flashings in masonry in accordance with CAN/CSA A371-14 and as follows:

.1 Install continuous flashings at exterior masonry, on foundation walls, slabs, shelf angles, window sills and at steel angles over openings. Install flashings under weep vent courses. Install flashings elsewhere as indicated, including below sills and copings.

.2 Remove or suitably repair damaged flashing membrane.

.3 Refer to drawings for arrangement of metal and membrane flashings. Mechanically fasten metal flashing with corrosion resistant fasteners.

.4 Carry flashings under outer masonry veneer, then up backing not less than 200 mm (8") unless otherwise indicated, and as follows:

.1 For masonry backing, turn flashing 25 mm (1") into horizontal mortar joint.

.2 At masonry and concrete backing, bond self-adhesive thru-wall sheet membrane flashing to air barrier membrane as recommended by membrane manufacturer, and seal top of lap joint with lap sealant.

.5 Overlap flashing joints 64 mm (2-1/2"). Roller membrane self-adhesive flashing joints. Seal non-self-adhering flashing and metal flashing lap joints with lap sealant.

.6 Install flashings to shed water in masonry cavity to exterior. Make flashings watertight.

.7 Dam ends of flashing at head and sill of glazing water tight.

.8 Keep flashing back 12 mm (1/2") from outside face of wall or veneer, unless otherwise indicated.

.9 Flashings are not to be visible, unless otherwise indicated.

3.14 Loose Steel Lintels

.1 Set and level lintels, centred over opening width, on a slip-sheet membrane, placed over bed or mortar.

.2 Allow suitable movement joint at ends of lintels for expansion and contraction movement at exterior lintels.

3.15 Lateral Supports

.1 In addition to requirements of *Contract Documents*, provide horizontal and vertical wall and partition lateral support anchors in accordance with CAN/CSA A370-14.

3.16 Movement (Control) Joints

.1 Provide continuous movement joints maximum 7480 mm (24'-6") on centre, and/or as indicated.

.2 Place movement joints at changes in wall direction, changes in building heights, at door and window locations where necessary and directed, at major changes in thickness of wall, periodic lengths of continuous wall (7480 mm (24'6") on centre maximum) and as directed by *Consultant* and as indicated.

.3 Review and coordinate movement joint locations with the *Consultant* prior to installation of masonry.

.4 Construct movement joints as indicated. Unless otherwise indicated, make movement joints 19 mm (3/4") wide. Cut masonry reinforcement at control joints.

.5 Stop reinforcing 25 mm (1") short of each side of movement joints unless otherwise indicated.

3.17 Horizontal Reinforcing

.1 Joint reinforcement:

.1 Install joint reinforcement in cavity walls, solid walls and partitions.

.2 Place reinforcement continuously in horizontal joints at 400 mm (16") on centre, beginning with course 400 mm (16") above bearing, unless otherwise indicated.

.3 Do not carry reinforcement through intersections where lateral support anchors are installed, at intersections of walls and partitions with solid piers and at block movement joints.

3.18 Bolts and Anchors

.1 Embed bolts and anchors solidly in mortar or grout to develop maximum resistance to design forces.

3.19 Structural Reinforcement

.1 Install to indicated requirements.

3.20 Temporary Bracing

.1 Provide adequate temporary bracing to masonry walls until floor and roof decks are installed and can develop adequate diaphragm action to brace walls.

3.21 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.1 Source quality control: Perform tests on masonry units to determine compressive strength as required by jurisdictional authorities in accordance with CAN/CSA A165 SERIES-14.

.2 Field tests and inspections:

.1 Provide mortar for strength testing in accordance with CAN/CSA A179-14 and Section 01 45 00.

3.22 Adjusting and Cleaning

.1 Protect masonry and adjacent work from damage from cleaning work.

.2 Clean masonry in accordance with masonry manufacturer's written requirements. Remove masonry and install new masonry, if masonry is damaged by cleaning work.

.3 Test cleaning agent and procedures by cleaning small, inconspicuous sample location prior to commencement of overall cleaning work. Review cleaning test area with *Consultant* and obtain acceptance in writing prior to cleaning remainder of areas requiring cleaning.

.4 Soak wall with clean water and flush off loose dirt and mortar.

.5 Apply specified cleaning agent in accordance with the manufacturer's direction, working from top to bottom.

.6 Rinse areas thoroughly with clean water to remove cleaning solutions, dirt, and mortar residue.

.7 Remove mortar from exposed masonry face immediately and prior to full set to avoid mortar staining of masonry units. Remove masonry and install new masonry, if mortar staining cannot be removed without damaging masonry work.

.8 Remove efflorescence and mortar deposits from surfaces to receive coatings and surfaces which are exposed to view. Remove efflorescence and mortar deposits from surfaces to receive coatings or surfaces which are exposed to view, occurring within a time period of 1 year after date of *Substantial Performance of the Work*

.9 Use proprietary PH-neutral cleaning solution with water as approved by manufacturer of masonry units in accordance with manufacturer's written directions. Use clean water to remove excess cleaning solution.

.10 Remove mortar droppings from flashings and other materials immediately to prevent damage and discolouration.

3.23 Protection

.1 Protect other materials and finishes from contamination by mortar droppings.

.2 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Lateral load-bearing cold-formed metal framing, including but not limited to metal studs, furring, at exterior assemblies subject to lateral and loads transferred by exterior cladding materials.

.1 Soffit cladding.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit engineered shop drawings. Field review requirements to be supplemented to include the following:

.1 Checking that mill test reports are properly correlated to materials.

.2 Sampling fabrication and erection procedures for general conformity to requirements of the *Contract Documents*.

.3 Checking fabricated members against specified member shapes.

.4 Sample checking of screwed and bolted joints.

.5 Sample checking that tolerances are not exceeded during fit-up or erection.

.6 General review of field cutting and alterations required by other sections.

.2 Include necessary shop details and erection diagrams. Indicate member sizes, locations thicknesses exclusive of coating, coatings and materials. Include connection details for attaching framing to itself and for attachment to the structure. Show splice details where permitted. Indicate dimensions, openings, requirements of related work and critical installation procedures. Show temporary bracing required for erection purposes.

.3 Indicate design loads and design calculations, including horizontal and vertical reactions at connections to building structure for all load cases.

1.4 Quality Assurance

.1 Qualifications:

.1 *Subcontractor*:

.1 Has adequate equipment and skilled workers to perform it expeditiously.

.2 Has successfully completed installations similar to that specified during a period of at least the immediate past 5 years.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Base design on limit states design principles using factored loads and resistances.

.2 Specified lateral loads shall be in accordance with the building code. For wind load calculations, the reference velocity pressure, q, shall be based on a 1 in 50 probability of being exceeded in any one year.

.3 Resistances and resistance factors shall be in accordance with the building code and CAN/CSA S136-16.

.4 Conform to the requirements of fire rated assemblies which have been tested in accordance with CAN/ULC S101-14 and provide indicated fire resistance rating.

.5 Design bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress effects due to torsion between lines of bridging. Do not rely on collateral sheathing to help restrain member rotation and translation perpendicular to the minor axis. Provide bridging at 1525 mm (60") on centre maximum. Space bridging at equal intervals over the span length of the member.

.6 Design anchorage and splice details for bridging.

.7 Design for local loading due to anchorage of cladding and interior wall mounted fixtures.

.8 Maximum flexural deflections under specified lateral loads shall conform to following:

.1 L/360 unless otherwise indicated.

.2 Metal framing supporting masonry veneer shall meet the requirements of CSA S304-14

.3 Metal framing assemblies supporting non-metal material clad soffits: L/720.

.9 Design components or assemblies to accommodate specified erection tolerances of the structure.

.10 Provide head, sill and jamb members and connections to frame openings larger than 100 mm (3-15/16") in any dimension.

.11 Limit free play and movement in connections perpendicular to the plane of the framing to ± 0.5 mm (0.019") relative to the building structure.

.12 Anchor top and bottom track to the structure at a maximum spacing of 813 mm (32") centre to centre. Closer spacing shall be required in accordance with design requirements.

.13 Allow for movement of structure. Design end connections to accommodate floor/roof deflections such that framing is not loaded axially.

.14 Connections between lightweight steel framing members shall be by bolts or sheet metal screws.

.15 Resistances for sheet metal screws shall be based on manufacturer's lowest bound test values multiplied by appropriate resistance factor, given in CAN/CSA S136-16.

.16 Coordinate framing and provide support for control joints specified in Section 09 29 00.

.17 Exterior soffit framing systems shall be inclusive of horizontal framing, secondary framing members, lateral braces, suspension members, and any other elements subject to lateral loads and dead loads of soffit cladding systems.

.18 Lateral load bearing metal framing include:

.1 Framing subjected to lateral loads.

.2 Steel bridging.

.3 Top and bottom track.

.4 Head and sill members and jamb framing for openings.

.5 Bridging and track connections.

.6 Top and bottom track connections to main structure including detailing to accommodate floor deflections.

2.2 Materials

.1 Steel to conform to requirements of CAN/CSA S136-16 and be identified as to specification, type grade and mechanical properties.

.1 Minimum base steel thickness exclusive of coating shall be as follows:

.1 1.087 mm (0.0428"). Use greater stud thickness if required by the design criteria.

.2 Minimum thickness for clip angles shall be 1.367 mm (0.054"). Use greater clip angle thickness if required by the design criteria.

.2 Metal framing members forming part of exterior building envelope shall have a minimum coating of Z275 galvanizing in accordance with ASTM A924/A924M-20. Other coatings providing equal or better corrosion protection may be used, subject to acceptance of *Consultant*.

.3 Sheet metal screws shall have a minimum coating thickness of 0.008 mm (0.0003") of zinc. Other coatings providing equal or better corrosion protection may be used, subject to acceptance of *Consultant*.

.4 Zinc rich paint for touching up damaged metallic coatings shall conform to CAN/CGSB 1.181-M99.

.5 Isolation strip; at exterior walls: Foam gasket; adhesive backed, closed cell vinyl foam strips, 3.2 mm thick, in width to suit steel stud size.

.6 Concrete anchors shall have a minimum coating thickness of 0.008 mm (0.00032") of zinc. Other coatings providing equal or better corrosion protection may be used.

.7 Screws:

.1 Steel screws shall be equal to or exceed minimum diameter indicated on shop drawings.

.2 Penetration beyond joined materials shall be not less than 3 exposed threads.

.3 Thread types and drilling capability shall conform to manufacturer's recommendations.

.4 Screws covered by sheathing materials shall have low profile heads.

2.3 Fabrication

.1 Provide cut-outs centred in webs of members to accommodate mechanical and electrical services. Effect of cut-outs on strength and stiffness of members shall be considered.

.2 Steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

PART 3 - EXECUTION

3.1 Erection

.1 Erect lateral load-bearing metal framing true and plumb within specified tolerances.

.2 Employ temporary bracing wherever necessary to withstand loads to which the structure may be subject during erection and subsequent construction.

.1 Leave temporary bracing in place as long as required for safety and integrity of structure.

.2 Erector shall verify that during erection a margin of safety consistent with the requirements of the building code and CAN/CSA S136-16.

.3 Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

.4 Erection tolerances:

.1 For purposes of this section, camber is defined as deviation from straightness of a member or any portion of a member or any portion of a member with respect to its major axis.

.2 For framing, out of plumbness shall not exceed 1/500th of member length. Out of straightness (camber and sweep) shall not exceed 1/1000th of the member length.

.3 Metal framing shall seat into top and bottom tracks. Gap between end of stud and web of track shall not exceed 4 mm (0.158").

.4 For track, camber shall not exceed 1/1000th of member length.

.5 Spacing of metal framing shall not be more than 3 mm (1/8") from design spacing. Cumulative error in spacing shall not exceed requirements of finishing materials.

.5 Make field measurements necessary to ensure proper fit of members.

.6 Cutting of members may be by saw or shear. Torch cutting is not permitted.

.7 Holes that are field cut into lightweight steel framing members shall conform to requirements of Paragraph 2.3.1 and 3.1.7.

.8 Insulation equal to that specified shall be placed in jamb and header assemblies that will be inaccessible after their installation into wall. Ensure that insulation is kept dry and not compressed.

3.2 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service. ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .5 ASTM A588 Corten Steel (weathering Steel)

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)
- .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
- .4 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
- .5 CSA W59-1989(R2001),Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .6 CSA G 4021 Weathering Resistant Steel

.4 The Environmental Choice Program
- .1 CCD-047a-98, Paints, Surface Coatings.
- .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.3 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with project requirements.
- .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's:
  - .1 For finishes, coatings, primers and paints.

.2 Shop Drawings:
- .1 Submit shop drawings for each element in accordance with Project Requirements.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.3 Each drawing submitted shall be bearing stamp and signature of professional engineer registered or licensed in province Ontario, Canada.

.3 Samples

.1 Provide 300mm x 300mm (or appropriate component-related dimension) samples of each metal component material for approval by the Consultant before proceeding with full production.

.2 Provide samples of handrail and railing components for approval by the Consultant before proceeding with full production.

.4 Mock-ups

.1 Provide all handrail type section mock-up (from support to support) for approval in accordance with Section 01 45 00 – Quality Control and Testing. Subject to approval, mock-up may remain as part of the work.

.5 Metal Fabricators:

.1 Submit proof of qualification of metal fabricators prior to engagement.

.1 All metal fabrication to be performed by fabricator with 20+ years' experience.

1.4 QUALITY ASSURANCE

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties as required by Building Codes and other municipal by-laws and regulations.

.2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with conditions of General Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with project requirements.

.2 Storage and Protection:

.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with local municipal by-laws or as directed by the Owner.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility approved by City.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W or 350W

.2 Handrails and Support, Footing, and Bracket:

.1 Powder coated stainless steel safety railing: material, fabrication, and finish as indicated on drawings.

.3 Custom Metal Screen – powder coated aluminum frame, brackets and baseplates. Perforated Aluminum panels:

.1 All aluminum to be powder coated white (RAL 9016)
.2 Approved fabricator:
.1 China Steel
164 Industrial Park Crescent
Sault Ste. Marie, ON P6B 5P2
(705) 942-3200

.4 For all items:
.1 Submit engineered shop drawings for review by the Consultant prior to manufacture and installation.

.5 Welding materials: to CSA W59 Series.

.6 Welding electrodes: to CSA Standards.

.7 Bolts and anchor bolts: to ASTM A325, as indicated on drawings and in accordance with shop drawings.

.8 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

PART 3 EXECUTION

3.1 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.5 All exposed hardware and anchoring to be tamper-proof. Visible bolts and fittings between parts should be as continuous and seamless as possible.

.6 Fabricator must be CWB certified to CSA standard W47.1 and have a minimum 20 years' experience.

3.2 FINISHES

.1 As indicated on Drawings.

.2 Powder Coating to ASTM D3451-06.

.1 High performance UC stayed, fluoropolymer resin (PVDF) free, exterior powder coating meeting American Architectural Manufacturers Association Specifications 2605 for Paint and Architectural Power Coat.

.2 Powder Coat to meet the following performance criteria:

.1 Colour Rendition: 10 Yrs. Fade = 5 Delta E
.2 Chalk Resistance: 10 Yrs. Chalk = 8
.3 Gloss Rendition: 10 Yrs. 50%
.4 Erosion Resistance 10 Yrs. 10% loss
.5 Dry Film Thickness 1.2 mil. Min.

3.3 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Landscape Architect such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Work of this section includes metal fabrications and related metals including, but not limited to, the following:

.1 Metal railings, primed. Finish painting coats shall be provided in accordance with Section 09 91 00.

.2 Washroom vanity metal supports, primed. Finish painting coats shall be provided in accordance with Section 09 91 00.

.3 Metal supports and assemblies for millwork bench.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 Submit list of fabrications to be provided as part of the work of this section.

.3 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.4 Shop drawings:

.1 Include plans, sections and large scale details, and shall indicate components and methods of assembly, materials and their characteristics, fastenings, metal finishes, welds, and their structural characteristics relative to their purpose, and other fabrication information required.

.2 Indicate proposed *Place of the Work* connections and methods.

.3 Submit coordination drawings indicating locations of concealed grounds, cutouts, plates, and other required fabrications.

.4 Show relation to adjoining construction, details of outside and inside corners and door openings.

1.3 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors: work of this section shall be executed only by a *Subcontractor* who has adequate plant, equipment, and skilled tradespersons to perform work expeditiously, and is known to have been responsible for satisfactory installations similar to that required in the *Work* during a period of at least the immediate past 5 years.

.2 Requirements of regulatory agencies: the work of this section that functions to resist forces imposed by dead and live loads shall conform to requirements of jurisdictional authorities.

1.4 Delivery, Storage, and Handling

.1 Label, tag or otherwise mark metal fabrications supplied for installation by other sections to indicate its function, location in building and shop drawing designation.

.2 Protect work from damage during delivery, storage and handling.

.3 Deliver work to location at the *Place of the Work* designated by *Contractor* and to meet requirements of construction schedule.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Design, fabricate, and install work of this section in accordance with the building code and requirements of all other governing authorities.

.2 Welding:

.1 Weld structural components in steel to conform to requirements of CSA W59-18, and by a fabricator fully certified by the Canadian Welding Bureau to conditions of CSA W47.1-19 and CSA W55.3-08 (R2018) as applicable.

.3 Stair stringers are to be designed to limit vibration as specified in CSA-S16-14, Appendix E, Guide for Floor Vibrations.

.4 Design assemblies and connections to withstand own dead load, live loads, super-imposed dead loads, and fabrication forces, without permanent distortions or deformation, to maximum allowable deflection of L/360, within the following construction tolerances:

.1 Maximum variation from plumb in vertical lines: 3.2 mm (1/8") in 3 m (10'-0").

.2 Maximum variation from level: 3.2 mm (1/8") in 9 m (30'-0").

.3 Maximum variation from straight: 3.2 mm (1/8") in 3 m (10'-0") under a 3 m (10'-0") straight edge.

.4 Maximum variation from angle indicated: 10 seconds.

.5 Tolerances shall be non-cumulative.

2.2 Materials

.1 General:

.1 Unless detailed or specified otherwise, standard *Products* will be acceptable if construction details and installation meet intent of the *Contract Documents*.

.2 Include materials, *Products*, accessories, and supplementary parts necessary to complete assembly and installation of work of this section.

.3 Incorporate only metals that are free from defects that are visible, or that impair strength or durability. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharply defined profiles.

.4 The engineer responsible for the production of the shop drawings is responsible for structural design, member sizes, arrangement, connections and anchoring of work of this section. Coordinate and maintain materials, dimensions, layout and appearance to meet intent of the *Contract Documents.*

.2 Metals:

.1 Steel:

.1 Structural shapes, plate, bars: hot-rolled, CSA G40.21-13, Grade 300W.

.2 Hollow structural sections: hot-formed, seamless, CSA G40.21-13, Grade 350W, Class H.

.3 Mild sheet and strip, hot rolled, ASTM A1011/A1011M-14.

.4 Cold rolled sheet, stretcher levelled, fully pickled, ASTM A1008/A1008M-13, Grade CS Type A exposed, matte finish, dry, unless otherwise indicated.

.5 Steel pipe to ASTM A53/A53M-12, Type E or S, Grade A or B, standard weight, Schedule 40 seamless black or AISI MT 1010/1015, or acceptable alternative.

2.3 Accessories

.1 Fasteners:

.1 Fasteners: Exposed fasteners to match the material surface on which they occur.

.2 Bolts and anchor bolts: to ASTM A307-21.

.3 High strength bolts: to ASTM A325-14.

.4 Concrete anchors; exterior exposed to weather: embedded epoxy set anchors, unless otherwise indicated.

.1 Size: in accordance with manufacturer's written requirements and reviewed shop drawings. Embedment depth shall not be greater than 80% of concrete thickness.

.5 Other types of fasteners as appropriate to meet design requirements.

.2 Welding materials:

.1 Steel: CSA W59-18.

.3 Grout:

.1 Epoxy grout; non-shrink, non-expanding:

.1 Acceptable *Products*:

.1 Hilti 'HY-200'.

.2 Sika 'Sika AnchorFix 3001'.

.3 W.R. Meadows 'REZI-WELD 3/2 EPOXY GROUT/PATCH'.

.2 Cementitious grout: non-shrink, non-expanding to ASTM C1107/C1107M-20:

.1 Acceptable *Products*:

.1 Sika 'Sika Grout 212' or 'Sika M-Bed Standard'.

.2 W.R. Meadows 'Sealtight CG-86 Construction Grout'.

.4 Dielectric separator: Best grade, quick drying non-staining alkali resistant bituminous paint to CAN/CGSB 1.108-M89, or membrane type to acceptance of *Consultant*.

2.4 Finishes

.1 Shop primer: Sherwin Williams 'Pro Industrial Pro-Cryl Universal Primer', 0.0076 mm (3 mils) DFT.

.2 Zinc rich paint; steel: Two-component zinc-rich coating, zinc powder to ASTM D520-00(2019) Type III ,SSPC-Paint 20, Type 1 Inorganic or single-component zinc-rich coating to SSPC-Paint, Type 2 Organic, CAN/CGSB 1.181-M99, VOC content <100 g/l to ASTM-D1475.

.1 Acceptable *Products*:

.1 Aervoe Industries, Inc. 'Low VOC Cold Galvanize Coating 93% Zinc'.

.2 ZRC Worldwide 'ZRC Zero-VOC Galvanizing Compound'.

.3 Hot dip galvanizing: conforming to ASTM A123/A123M-13, minimum zinc coating of 600 g/m². Use air cooling method (no water or chromate dipping treatment permitted).

2.5 Fabrication

.1 General:

.1 Fabricate metal fabrications with machinery and tools specifically designed for the intended manufacturing processes and by skilled tradesmen.

.2 Fit and assemble metal fabrications in shop. When this is not possible, make a trial shop assembly.

.3 Incorporate means for fastenings of other work secured to work of this section.

.2 Construction:

.1 Fabricate with materials, component sizes, metal gauges, reinforcing, anchors, and fasteners of adequate strength to withstand intended use, and within allowable design factors imposed by jurisdictional authorities. Fabricate items from steel unless otherwise noted.

.2 Ensure that metal fabrications will remain free of warping, buckling, opening of joints and seams, distortion, and permanent deformation.

.3 Construct items that are part of floor construction, such as gratings and trench covers, to support the same live loads for which surrounding construction is designed.

.3 Assembly:

.1 Accurately cut, machine and fit joints, corners, copes and mitres so that junctions between components fit together tightly and in true planes.

.2 Provide smooth welds with splatter removed where exposed to view.

.3 Allow for differential movements within assemblies and at junctions of assemblies with surrounding *Work*.

.4 Field welding of hot dipped galvanized members permitted only when other fastening methods are not possible. Locations of field welds to be clearly identified on reviewed shop drawings.

.5 Incorporate holes and connections for work installed under other sections.

.6 Cleanly and smoothly finish exposed edges of materials including holes.

.7 Cap open ends of sections exposed to view, such as pipes, channels, angles, and other similar work.

.4 Shop prime painting; premium quality:

.1 Clean loose mill scale, rust, dirt, weld flux and spatter from work after fabrication.

.2 Clean and prepare surfaces to meet specified requirements of SSPC SP-6 and paint manufacturer's installation requirements.

.3 Apply primer in accordance with paint manufacturer's installation requirements.

.5 Galvanizing:

.1 Galvanize metal fabrications following fabrication.

.2 Paint damage galvanized surfaces with zinc rich paint, immediately following damage to galvanized protection. Prepare substrate to remove oil and grease to SSPC-SP1-16, rust scale to SSPC-SP3-18, mill scale to SSPC-SP6.

.3 Fill vent and drain holes that are exposed in the finished *Work*, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 - EXECUTION

3.1 Examination

.1 Take measurements at the *Place of the Work* to ensure that metal fabrications are fabricated to fit surrounding construction, around obstructions and projections in place, or as indicated, and to suit service locations.

3.2 Installation

.1 Install metal fabrications plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work.

.2 Include in work of this section anchor bolts, high tensile bolts, washers and nuts, expansion bolts, toggles, straps, sleeves, brackets, clips, and other items necessary for secure installation as required by loading and jurisdictional authorities.

.3 Attach metal fabrications to interior concrete and masonry with corrosion resistant expansion bolts to support load with a safety factor of 3.

.4 Insulate between dissimilar metals or between metal, and masonry or concrete with bituminous paint to prevent electrolytic action.

.5 Where indicated, grout metal posts, pickets, balusters, and the like, in metal sleeves cast into concrete, with non-shrink quick setting epoxy anchor cement, unless detailed otherwise. Fabricate sleeves of 75 mm (3") minimum in depth.

.6 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

3.3 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

3.4 Adjusting and Cleaning

.1 After erection, touch up primed surfaces that are burned, scratched or otherwise damaged with prime paint to match shop paint.

.2 Clean and repair areas of bare metal and welds on galvanized surfaces with zinc rich paint. Welded area of members to be masked to minimize overpainting of adjacent undamaged surfaces. Prepare substrate to remove oil and grease to SSPC-SP1-16, rust scale to SSPC-SP3-18, mill scale to SSPC-SP6.

.3 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

3.5 Protection

.1 Protect finished surfaces from damage from time of installation until final finishes are applied or to final cleanup.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 The work of this section includes, but is not necessarily limited to, the following:

.1 Wood grounds, nailers, blocking and sleepers.

.2 Wood roof blocking.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

1.3 Delivery, Storage, and Handling

.1 When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

PART 2 - PRODUCTS

2.1 Wood Materials

.1 General requirements:

.1 Except as indicated or specified otherwise lumber shall be softwood, S4S, moisture content not greater than 19% at time of installation, in accordance with following standards:

.1 CSA O141-05.

.2 NLGA-2014 Standard Grading Rules for Canadian Lumber.

.2 Furring, blocking, nailing strips, grounds:

.1 Use S2S material.

.2 Dimension lumber sizes: in compliance with Section 12 of the NLGA-2014.

.3 Dimension lumber species and grades:

.1 Spruce-Pine-Fir.

.2 Light framing to NLGA-2014 Construction grade, S-Dry.

.3 Planks to NLGA-2014 No. 2 grade, S-Dry.

.4 Boards to NLGA-2014 No. 4 Common grade, S-Dry.

.3 Curbs, nailers, plywood for roofing: Spruce species, NLGA construction grade, sound and free of imperfections or deficiencies making unsuitable for use. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.2 Panel Materials

.1 Softwood plywood (CSP): to CSA O151-09.

.2 Douglas Fir plywood (DFP): to CSA O121-08.

2.3 Sheathing Materials

.1 Exterior sheathing:

.1 Exterior grade plywood, 12.7 mm (1/2") thickness unless otherwise indicated, tongue and groove.

2.4 Fastenings and Hardware

.1 General:

.1 Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 38 mm (1-1/2") into wood substrate.

.2 Anchors to concrete and unit masonry: Capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing according to ASTM E488/E488M-18, conducted by a qualified independent inspection and testing company.

.3 Use surface fastenings of following types, except where specific type is indicated.

.1 To hollow masonry, plaster and panel surfaces use 9 mm (11/32") expansion bolts or other acceptable anchor.

.2 To solid masonry and concrete use expansion bolts.

.3 To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts.

.4 Fastener materials:

.1 Hot-dip galvanized fasteners: ASTM A153/A153M-09 Class A or B1 G185 and connectors meeting ASTM A653/A653M-13 Class G-185 sheet or better.

.5 Hardware materials:

.1 Hot-dipped galvanized complying with ASTM A153/A153M-09, Class A or B1, and connectors complying with ASTM A653/A653M-13, Class G185.

.2 Sheathing fasteners: Bugle head, corrosion resistant steel, power driven type, minimum length of 3 times thickness of sheathing.

2.5 Source Quality Control

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

PART 3 - EXECUTION

3.1 General

.1 Layout work to accommodate work of others. Cut and fit accurately. Erect in position indicated. Align, level, square, plumb, and secure work permanently in place.

.2 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolt head and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of work.

.3 Include in work of this section rough hardware such as nails, bolts, nuts, washers, screws, clips, and connectors required for complete and proper installations; and operating hardware required on work of this section for temporary use.

.4 Do not attach work by wood plugs or blocking in concrete or masonry.

.5 Do not regard nailers, blocking, and such other fastening provision indicated as exact or complete. Install required provisions for fastening, located and secured to suit *Place of the Work* conditions, and adequate for intended support.

.6 Verify that grounds required for fastening of components and equipment are located correctly, and sized for adequate support.

3.2 Curbs, Supports, and Blocking at Roofing Assemblies

.1 Install wood curbs, upstands, supports and blocking and securely attach to structure, trimmed and levelled to receive flashings and applied roofing materials.

.2 Slope solid wood caps at parapets to provide positive moisture drainage toward roofing membrane unless otherwise indicated.

.3 Provide wood nailers of minimum 38 mm (1-1/2") thick solid wood members for anchorage of fasteners.

.4 Securely attach wood members to substrate by anchoring and fastening as indicated, complying with the following:

.1 Attach each item in the build-up with fasteners or anchors at spacing not exceeding the following:

.1 Wood to wood:

.1 Screws: 450 mm (18").

.2 Nails: 300 mm (12").

.2 Wood to metal:

.1 Screws: 450 mm (18").

.2 Bolts/washers: 1220 mm (48").

.3 Wood to concrete/concrete block:

.1 Tapcon type screws: 450 mm (18").

.2 Expansion/toggle bolts/washers: 1220 mm (48").

.2 Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces.

.3 Size fasteners for embedment into substrate in accordance with manufacturer's installation requirements.

.5 Select fasteners of size that do not fully penetrate members where opposite side is exposed to view. Make tight connections between members. Install fasteners without splitting wood.

3.3 Roof Sheathing

.1 Secure roof sheathing perpendicular to framing members with ends staggered. Secure sheet edges over firm bearing.

.1 Stagger panel joints minimum 812 mm (32") at multiple sheathing layer locations; glued and screwed.

.2 Secure sheathing for roof diaphragms at spacing indicated.

.3 Secure deck sheathing perpendicular to framing members with ends staggered. Secure sheet edges over firm bearing.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Cedar wood slats for interior and exterior wood benches.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data for each type of *Product* and process proposed for use in the work of this section.

.3 Samples:

.1 Submit 3 sets of 200 mm x 200 mm (8" x 8") samples, or 200 mm (8") long as applicable, of each specified *Product*, material and finish, including but not limited to the following:

.1 Hardwood lumber, showing each type of finish, edge treatment and grain.

1.3 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit maintenance data for incorporation into maintenance manuals.

1.4 Quality Assurance

.1 Qualifications: work of this section shall be executed only by a *Subcontractor* who has adequate plant, equipment, and skilled tradespersons to perform work expeditiously, and is known to have been responsible for satisfactory installations similar to that required in the *Work* during a period of at least the immediate past 5 years.

.2 Mock-ups:

.1 Provide mock-ups, with specified finish, of sizes and in locations as directed by *Consultant*.

.2 Mock-ups may become part of finished work, at sole discretion, and with prior written acceptance of *Consultant*.

1.5 Delivery, Storage, and Handling

.1 Protect woodwork during transit, delivery, storage and handling to prevent damage and deterioration.

.2 The *Subcontractor* and the *Contractor* shall be jointly responsible to make certain that woodwork is not delivered until the building and storage areas are sufficiently dry so that the architectural woodwork will not be damaged by excessive changes in moisture content.

PART 2 - PRODUCTS

2.1 Exterior Woodwork

.1 Types:

.1 Bench:

.1 Board size: nominal 50 x 100 mm (2" x 4").

.2 Finishing: Clear.

2.2 Lumber Materials

.1 Softwood lumber:

.1 Species: Clear Western Red Cedar.

.2 Lumber stock shall be supplied with board ends sealed with clear aqueous wax sealer.

.2 Softwood lumber; for concealed framing and furring:

.1 Softwood lumber, S4S, moisture content not greater than 19% at time of installation, in accordance with following standards:

.1 CSA O141-05.

.2 NLGA-2014.

.2 Furring, blocking, nailing strips, grounds:

.1 Use S2S material.

.2 Board sizes: Spruce species, NLGA-2014 construction grade, S-DRY.

2.3 Accessories

.1 Drilled fasteners:

.1 At bench, locations: Series 300 stainless steel #8 Robertson.

.2 Bolt, nut, washer, screw and pin type fasteners: Series 300 stainless steel.

.1 Use surface fastenings of following types, except where specific type is indicated.

.1 To hollow masonry, plaster and panel surfaces use 9 mm (11/32") expansion bolts or other acceptable anchor.

.2 To solid masonry and concrete use expansion bolts.

.3 To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts.

.3 Hardwood dowels: Matching hardwood lumber specie, grade and cut dowels.

.4 Construction adhesive; for hardwood plugs: clear, non-shrink, high performance, non-brittle, waterproof structural 2-part epoxy adhesive or as recommended by hardwood lumber supplier.

.1 Acceptable *Product*:

.1 'T-88 Structural Adhesive' by System Three Resins, Inc., tel: 1-800-333-5514.

.5 Hardwood lumber ends sealer:

.1 Clear aqueous wax sealer to seal cut hardwood lumber board ends.

.2 As recommended by lumber supplier.

2.4 Finishes - Marine Oil Finish

.1 Marine oil finish; site applied clear finish:

.1 Surface preparation coating: Minimum 1 coat to clean, brighten, and eliminate hard mill glaze from boards.

.1 Acceptable *Products*:

.1 Penofin '1st Step Prep for Hardwood'.

.2 Finish coating: 2 coats clear penetrating marine oil finish.

.1 Acceptable *Products*:

.1 Penofin 'Penetration Marine Oil'.

2.5 Source Quality Control

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

PART 3 - EXECUTION

3.1 General

.1 Layout work carefully and to accommodate work of others. Cut and fit accurately. Erect in position indicated. Align, level, square, plumb, and secure work permanently in place.

.2 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolt head and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of work.

.3 Include in work of this section rough hardware such as nails, bolts, nuts, washers, screws, clips, and connectors required for complete installations.

.4 Do not attach work by wood plugs or blocking in concrete or masonry.

.5 Do not regard nailers, blocking, and such other fastening provision indicated as exact or complete. Install required provisions for fastening, located and secured to suit site conditions, and adequate for intended support.

.6 Cut work into lengths as long as practical and with square ends. Erect work plumb, in true planes, and fastened rigidly in place.

.7 Immediately after cutting, apply end sealer to cut ends of lumber boards with clear aqueous wax sealer.

.8 Fastenings:

.1 Wood shall be pre-drilled for fasteners with countersunk bit.

.1 At concealed locations, set fasteners flush with finished face of wood.

.2 At exposed locations, countersink fasteners and conceal with glued hardwood dowels.

.2 Evenly space fasteners and align in both directions.

.3 Fasteners shall not bind or crush wood fibres.

.9 Mitre corners. No exposed edge grain shall be permitted unless approved by *Consultant*. Where permitted, end grain must be sanded.

.10 Provide full length bench boards; board length to suit bench length without intermediate board joints along bench length.

.11 Secure boards to concrete with power driven self-drilling stainless steel fasteners.

3.2 Finish - Marine Oil Finish

.1 Surface preparation coating:

.1 Prepare surfaces and apply surface preparation coating in accordance with manufacturer's written requirements.

.2 Lightly sand surface before finishing.

.3 Wet surface with clean, plain water to remove impurities.

.4 Apply surface preparation coating to wet surface with pump-up sprayer as recommended by manufacturer.

.5 Allow to set for 15 to 30 minutes then rinse away with plain water while brushing with a stiff bristled, non-metallic, brush. Do not use steel wool.

.6 Rinse again and allow to dry.

.2 Finish coating:

.1 Apply finish coating to board faces and edges. Back-coat woodwork prior to installation in accordance with manufacturer's written requirements.

.2 Thoroughly mix coating material; do not dilute.

.3 Spray-apply finish coating to clean, dry surfaces. Surface to be free of dirt and sawdust. Do not apply coating in direct hot sunlight.

.4 Wait 30 minutes to allow coating penetration into wood, use a nap-free cloth to wipe entire coated surfaces, removing excess coating material.

.5 Wait minimum 3 hours before recoating, spray-apply second coat using same method as first coat application.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Bituminous dampproofing.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

1.3 Quality Assurance

.1 Qualifications: Execute the work of this section only by a *Subcontractor* who has adequate plant, equipment and skilled workers to perform it expeditiously, is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.2 Maintain one copy of manufacturer installation requirements on site.

1.4 Field Conditions

.1 Installation shall not be performed during rainy or inclement weather and on frost or wet covered surfaces.

.2 Do not apply materials in wet weather or on wet substrates.

.3 Store membrane at temperature of 5°C and above to facilitate handling.

.4 Store role materials horizontally in original packaging.

.5 Store adhesives and primers at temperatures of 5°C and above to facilitate handling.

PART 2 - PRODUCTS

2.1 Materials

.1 Dampproofing coating; for ambient and substrate temperatures below 5°C:

.1 Primer: Penetrating asphalt primer, to CGSB 37-GP-9Ma-1983.

.2 Cut-back asphalt: to CAN/CGSB 37.16-M89.

.2 Dampproofing coating; for ambient and substrate temperatures above 5°C:

.1 Mineral colloid asphalt emulsion: to CAN/CGSB 37.2-M88.

.3 Sealing compound, rubberized asphalt: to CAN/CGSB 37.29-M89 and as recommended by dampproofing manufacturer.

PART 3 - EXECUTION

3.1 Application

.1 Before applying dampproofing, seal holes around pipes and penetrations and services using sealing compound.

.2 Apply dampproofing to indicated locations and to a line no less than 150 mm (6") below finished grade level.

.3 Dampproofing coating; for ambient and substrate temperatures below 5°C:

.1 Apply primer at rate of 0.5 to 2 l/m² (100 to 400 ft²/gal) and allow curing until touch dry.

.2 Apply top coat at rate of 1 to 1.5 l/m² (2 to 3 gal/100 ft²) and allow to cure.

.4 Dampproofing coating; for ambient and substrate temperatures above 5°C:

.1 Apply asphalt emulsion foundation coating diluted 20% with potable water at the rate of 0.5 l/m² (1 gal/100 ft2) as a primer and allow drying.

.2 Apply second coat of undiluted asphalt emulsion foundation coating at rate of 1 to 1.5 l/m² (2 to 3 gal/100 ft²) and allow drying.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Waterproof traffic coating systems.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Samples:

.1 Submit samples of each specified material, in each specified colour to show successive applications of each coat.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Maintenance instructions:

.1 Submit maintenance instructions for incorporation into maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Applicator:

.1 ProvideProvideHave adequate equipment and skilled workers to perform the work expeditiously.

.2 Approved by *Supplier* of traffic surface materials.

.3 Has successfully completed installations similar to that specified during a period of at least the immediate past 2 years.

.2 *Subcontractor* shall be a manufacturer certified installer, and shall have proven experience with specified system.

.2 Mock-up:

.1 Construct 2 m^2 (20 ft^2) mock-up panel of typical traffic surface waterproofing system at the *Place of the Work* as part of final installation for review, location to be determined by *Consultant*.

1.6 Delivery, Storage, and Handling

.1 Store materials at the *Place of the Work* in an area specifically set aside for purpose that is locked and ventilated. Maintain materials at minimum temperature of 15.5°C before use.

.2 Ensure compliance with health and fire regulations during storage, handling and application.

.3 Deliver and store materials undamaged, in original containers, with manufacturer's labels and seals intact.

1.7 Field Conditions

.1 Coat surfaces only with surface temperatures at a minimum of 10°C for 72 hours before, during and following application, or until cured, when no dust is being raised, and in well-ventilated and broom clean areas.

.2 Ensure substrate is sound, dry, free of dust, dirt, paint, grease, oil or other foreign substances.

.3 Ensure adequate ventilation during installation.

.4 Advise other *Subcontractors* of fixtures and fittings not to be installed until traffic surface is cured.

.5 Protect adjacent surfaces from damage resulting from work of this section. If necessary, mask and/or cover adjacent surfaces, fixtures, equipment, and the like by suitable means.

.6 Concrete substrate conditions:

.1 Concrete shall be clean, sound, compressive strength 20 MPa (2900 psi) minimum, crack free and contain 3% maximum moisture content by mass.

.2 Test for moisture content in accordance with manufacturer's specifications and the following:

.1 Remove concrete chippings, wrap in vapour retardant plastic and deliver immediately to lab.

.2 Test in accordance with ASTM D1864/D1864M-89(2017).

.3 Concrete shall be free from sealers or membrane curing agents or other foreign matter.

.4 Allow concrete to cure 28 days minimum before applying traffic surfacing.

.5 Concrete shall have light steel trowel finish.

.6 Finish surfaces shall be level, or straight where sloped to drains. Variation in plane of substrate shall not exceed 1:500. Deviations or deteriorated concrete shall be repaired prior to start of work of this section.

PART 2 - PRODUCTS

2.1 Service Room Pedestrian Grade Traffic Coating

.1 General performance requirements:

.1 System description:

.1 Solid epoxy, seamless, pigmented floor system.

.1 Primer: type as recommended by manufacturer to suit project conditions.

.2 Broadcast coats.

.3 Grout coat.

.4 Top coat.

.2 System performance requirements:

.1 VOC content: LEED compliant.

.2 Suitable for pedestrian traffic, skid resistant aggregate loaded top surface, and waterproof.

.3 Aggregated slip-resistant surface.

.4 Watertight.

.2 Application: broadcast.

.3 Texture Standard non skid.

.4 Colour: as selected by *Consultant*.

.2 Acceptable Product:

.1 Dur-A-Flex 'Shop Floor'.

.2 Substitutions: in accordance with Section 01 25 00.

2.2 Auxiliary Materials

.1 Each material used in the application of each flooring system shall be as recommended or manufactured by the *Supplier* of the coating.

.2 Primers, crack and joint fillers, and block wall fillers and other fillers: as recommended by membrane manufacturer.

.3 Sealant: in accordance with waterproofing system manufacturer's written installation requirements.

PART 3 - EXECUTION

3.1 Examination

.1 Verify environmental and *Place of the Work* conditions are suitable for application and curing before commencing work of this section.

.2 Examine surfaces to receive traffic surfacing. Surfaces shall be smooth, sound, dry, and free from conditions that will adversely affect execution, permanence, or quality of work. Test surfaces for moisture content to ensure that they are suitable for application, and fully cured.

.3 Surfaces to receive traffic surfacing shall be provided as specified in the work of other sections, they will not adversely affect execution, permanence, or quality of the work of this section, and they can be put into acceptable condition by means of preparation specified in this section.

.4 Defective work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the work of this section.

3.2 Notification

.1 Report deficiencies in writing to *Consultant* prior to commencing the work of this section.

.2 Commencement of work shall imply acceptance of surfaces and conditions.

3.3 Preparation

.1 Thoroughly clean surfaces to receive coating by steel shot-blast, sandblast or other method in accordance with manufacturer's written requirements.

.2 Fill open control joints, and other cracks and voids with sand filled/epoxy mortar.

.3 Clean, prime and seal surfaces as recommended by traffic surfacing manufacturer.

.4 Rout or sawcut cracks exceeding 1.0 mm (0.04") in width and fill with manufacturer's recommended sealant.

3.4 Installation

.1 General:

.1 Apply traffic surfacing in accordance with manufacturer's written requirements.

.2 Apply traffic surfacing with care to ensure that no laps, voids, or other marks or irregularities are visible, and with an appearance of uniform colour, sheen and texture, within limitations of materials and areas concerned.

.3 Make clean true junctions with no visible overlap between adjoining applications of coatings.

.4 Place cloths and other disposable coating materials that are a fire hazard, in closed metal containers and remove from building at the end of each *Working Day*.

.2 Apply primer followed by traffic surfacing in accordance with manufacturer's written requirements.

.3 Embed waterproofing membrane within drain assembly in accordance with manufacturer's recommended details to provide watertight seal.

.4 Apply top coat to achieve a uniform, slip resistant surface.

.5 Provide 200 mm (8") high base to columns, walls, and against vertical surfaces, unless otherwise indicated.

.6 Match finished work to accepted samples; uniform in thickness, sheen, colour, texture and be free from defects detrimental to appearance or performance.

3.5 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00, and as follows:

.1 Verify by Tooke thickness gauge, and in the presence of *Consultant*, that thicknesses of complete traffic surfacing is in accordance with the *Contract Documents*.

.2 Manufacturer's field review to be in accordance with Section 01 45 00.

3.6 Adjusting and Cleaning

.1 As work progresses, promptly remove spilled or spattered coating materials from surfaces of work performed under other sections.

3.7 Protection

.1 Advise other *Subcontractors* of fixtures, fitting and finishing not to be installed or started until decking is completed.

.2 Traffic control: prohibit other *Subcontractors* from entry into areas during application and until surface has cured, and include protection after cure against damage by other *Subcontractors*.

.3 Apply temporary protection of completed traffic surfacing as required.

.4 Cover or mask surfaces adjacent to those receiving traffic surfacing to protect work of other sections and property from damage and soil.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Mineral wool cavity insulation (batt insulation); Unfaced, mineral-fibre batts.

.2 Semi-rigid insulation board.

.3 Rigid insulation board; below grade insulation.

.4 Rigid insulation board; masonry wall insulation.

.5 Foamed-in-place (gap filler) filler insulation.

.2 Section excludes:

.1 Rigid roof insulation: in accordance with Section 07 54 23.

.2 Semi-rigid insulation at curtain wall: in accordance with Section 08 44 00.

.3 Acoustic batt insulation: in accordance with Section 09 29 00.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.2 Submit data and installation instructions for materials and prefabricated devices, providing descriptions sufficient for identification at the *Place of the Work*.

.3 Submit data from manufacturer's or independent laboratory indicating compatibility and adhesive results of proposed materials.

1.3 Quality Assurance

.1 Qualifications:

.1 Execute work of this section using a *Subcontractor* who has adequate plant, equipment and skilled workers to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

PART 2 - PRODUCTS

2.1 Insulation Materials

.1 Mineral wool cavity insulation:

.1 Unfaced, mineral-fibre batts, to CAN/ULC S702-14, Type 1.

.2 Acceptable *Products*:

.1 CertainTeed Insulation Canada Inc. 'Fibre Glass Building Insulation'.

.2 Johns Manville 'Unfaced Batts'.

.3 Owens Corning 'EcoTouch PINK FIBERGLAS'.

.4 Knauf Insulation 'EcoBatt'.

.5 Rockwool 'ComfortBatt'.

.2 Semi rigid mineral wool insulation board:

.1 Mineral-fibre to CAN/ULC S702-14, Type 1, either dual density or mono density.

.1 Dual density:

.1 Outer layer: 100 kg/m^3 (6.25 lb/ft^3) to ASTM C612-14.

.2 Inner layer: 65 kg/m^3 (4.1 lb/ft^3) to ASTM C612-14.

.2 Mono density:

.1 96 kg/m^3 (6.0 lb/ft^3) to ASTM C612-14.

.2 Acceptable *Products*:

.1 Johns Manville 'Cladstone Water & Fire Block Insulation – 6.0 PCF'.

.2 Owens Corning 'Thermafiber RainBarrier HD'.

.3 Rockwool 'CavityRock'.

.3 Rigid insulation board; below grade insulation:

.1 Extruded polystyrene, closed-cell, smooth skin, to CAN/ULC S701.1-17, Type 4, 207 kPa (30 psi) compressive strength.

.2 Acceptable *Products*:

.1 DuPont 'Styrofoam SM'.

.2 Owens Corning 'Foamular C-300'.

.3 Soprema 'SOPRA-XPS 30'.

.4 Rigid insulation board; masonry wall assemblies:

.1 Extruded polystyrene to CAN/ULC S701.1-17, Type 3:

.2 Acceptable *Products*:

.1 DuPont 'CavityMate'.

.2 Owens Corning 'Foamular C-200'.

.3 Soprema 'Sopra-XPS-20'.

.5 Polyurethane Foam for thermal insulation around exterior framing assemblies (Gap Filler):

.1 One-component CFC-free polyurethane foam to CAN/ULC S710.1-11.

.1 Acceptable Product:

.1 Adfast 'Adfoam Flexible 1865'.

.2 Great Stuff Pro 'Window and Door Polyurethane Foam Sealant'.

.3 Sika 'Sika Boom Arctic'.

.4 Tremco 'ExoAir LEF'.

2.2 Accessories

.1 Insulation fasteners: HDPE washer, zinc plated pin finish, pins purpose made to suit substrate material, 50 mm (2") minimum insulation holding diameter; direct fasten type, pin depth length to suit insulation thickness.

.1 For insulation equal or less than 150 mm (6") thick:

.1 Acceptable *Product*:

.1 ITW Construction Products Ramset 'InsulFast'.

.2 For insulation greater than 150 mm (6") and equal or less than 200 mm (8") thick:

.1 Acceptable *Product*:

.1 Hilti 'X-IE'.

.2 Adhesive for rigid insulation boards: Polymer modified liquid applied membrane, compatible with insulation to be applied, type as manufactured for the attachment of insulation.

.1 Acceptable *Product*:

.1 Henry Airbloc 21 or 230-21.

.3 Batt insulation wire mesh restraint; locations where insulation is not sandwiched by sheet metal or board materials: Zinc coated woven wire and mechanical fasteners.

PART 3 - EXECUTION

3.1 Installation - General

.1 Install insulation in accordance with manufacturer's written requirements applicable to products and applications indicated.

.2 Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

.3 Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

.4 Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

.5 Install attachment at rate as required to prevent displacement of insulation boards during construction operations.

.6 Butt joints tightly and offset vertical joints to form an unbroken thermal envelope. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.7 Apply insulation to ensure total and complete coverage of surfaces indicated to be insulated, and in direct contact with such surfaces.

.8 Ensure integrity and continuity of insulation at juncture with different types of materials and seal in an acceptable manner.

.9 Do not cover insulation until it has been reviewed and accepted by *Consultant*.

3.2 Installation – Mineral Wool Cavity Insulation

.1 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.2 Install batt insulation to fill cavity unless otherwise indicated.

.3 Trim insulation to provide close-fit contact to framing assemblies and fill the required cavity or insulation assemblies to thicknesses specified or indicated.

.4 Do not over compress or pack insulation to fit into spaces; maintain density to be consistent with the density of the uncompressed batt product.

.5 Cut insulation to provide close-fit contact around electrical boxes, pipes, and other obstructions and penetrations through and within assemblies.

.6 Secure insulation in such a manner that it will not sag or settle away from required locations.

.7 Install continuous woven wire restraint mechanically fastened to steel studs to hold insulation against exterior sheathing materials.

.8 Place insulation equal to that indicated for applicable assembly in jamb and header assemblies that will be inaccessible after their installation into wall.

3.3 Installation - Semi-Rigid Insulation

.1 Install at masonry assembly locations in accordance with Section 04 05 00.

.1 Where applicable, fasten insulation using masonry tie securement plates provided under Section 04 05 19.

.2 In locations where insulation clips are not practical or available with masonry connectors, mechanically fastened to substrate with minimum of 5 insulation fasteners per insulation board and maximum spacing of 610 mm (24") on centre.

.3 Position fasteners 75 mm (3") from insulation board edges.

.2 For other cladding assemblies:

.1 Mechanically fasten to substrate with minimum of 5 insulation fasteners (dice pattern) per insulation board and maximum spacing of 610 mm (24") on centre.

.2 Position fasteners 75 mm (3") from insulation board edges.

3.4 Installation - Rigid Insulation

.1 Edge butter rigid insulation joints with adhesive and trowel flush with insulation face at wall cavity insulation locations.

.2 Butter masonry tie penetrations with adhesive at wall cavity insulation locations.

.3 Apply insulation boards with board joints staggered and offset between insulation layers; mechanically fastened to substrate with minimum of 5 insulation fasteners per insulation board and maximum spacing of 610 mm (24") on centre.

3.5 Installation - Below-Grade Rigid Insulation

.1 On vertical surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written requirements.

.2 On horizontal surfaces, loosely lay insulation units according to manufacturer's written requirements. Stagger end joints and tightly abut insulation units.

.3 Apply insulation boards with board joints staggered and offset between insulation layers; mechanically fastened to substrate with minimum of 5 insulation fasteners per insulation board and maximum spacing of 610 mm (24") on centre.

3.6 Installation - Foamed-in-Place (Gap Filler) Insulation

.1 Install one-component foam insulation to fill gaps where indicated, in accordance with CAN/ULC S710.2-11 application standard.

3.7 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.1 Independent inspection and testing company shall:

.1 Perform inspection for completed work.

.2 Perform thickness verification.

3.8 Protection

.1 Comply with manufacturer's written requirements respecting protection.

.2 Protect polystyrene insulation from extended exposure to sunlight.

.3 Repair damage resulting from performance of work of this section in manner acceptable to *Consultant*.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Above-grade vapour barrier.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Samples:

.1 Submit sample of proposed *Products* for review by *Consultant*.

1.4 Quality Assurance

.1 Qualifications: Provide work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.2 Mock-up:

.1 Construct 10 m² (100 ft²) area of typical installation for each type of *Product*.

.1 Construct mock-up of sheet vapour barrier installation including one lap joint, one inside corner and at one electrical box. Mock-up may be part of finished work.

.2 Locate at the *Place of the Work* as part of final installation. Space installation to include exterior wall panel incorporating window and insulation.

.3 Do not proceed until mock-up has been reviewed by *Consultant*.

.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

PART 2 - PRODUCTS

2.1 Sheet Vapour Barrier

.1 Polyethylene film: CAN/CGSB 51.34-M86, Type 1, 0.15 mm (6 mil) thick, with a water vapour permeance of not greater than 45 ng/(P•s•m²), flame spread rating of less than 150 to CAN/ULC-S102-10.

2.2 Accessories

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape.

.1 Acceptable *Products*:

.1 Tuck Tape 'Tuck Blue Sheathing Tape for PE Vapour Barrier'.

.2 Lap sealant:

.1 Gunnable sealant, adheres to polyethylene film, non-acrylic based.

.1 ASTM C920-14 Type N or S, Grade NS, Use NT or ASTM C919-12(2017).

.2 Acceptable *Products*:

.1 DOWSIL '758 Silicone Weather Barrier Sealant'.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Gunnable sealant, adheres to polyethylene film, non-hardening synthetic rubber.

.1 Acceptable *Products*:

.1 Pecora 'BA98'.

.2 Tremco 'Acoustical/Curtainwall Sealant'.

.3 QuietSeal 'Acoustic Sealant QS-350'.

.2 Substitutions: in accordance with Section 01 25 00.

.3 Staples and fasteners: minimum 6.4 mm (1/4") leg.

PART 3 - EXECUTION

3.1 Installation

.1 Ensure services are installed and inspected prior to installation of sheet vapour barrier.

.2 Install sheet vapour barrier on interior side of insulation at exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous application.

.3 Use sheets of largest practical size to minimize joints.

.4 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.2 Attachment

.1 Seal vertical joints in sheet vapour barrier over framing by lapping no fewer than two studs.

.2 Fasten sheet vapour barrier to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners at 400 mm (16") on centre.

3.3 Exterior Surface Openings

.1 Cut sheet vapour barrier to form openings and ensure material is lapped and sealed to frame.

3.4 Perimeter Seals

.1 Seal perimeter of sheet vapour barrier as follows:

.1 Apply continuous bead of sealant to substrate at perimeter of sheets.

.2 Lap sheet over sealant and press into sealant bead.

.3 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5 Lap Joint Seals

.1 Seal lap joints of sheet vapour barrier as follows:

.1 Attach first sheet to substrate.

.2 Apply continuous bead of sealant over solid backing at joint.

.3 Lap adjoining sheet minimum 150 mm (6") and press into sealant bead.

.4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.6 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Below-grade vapour barrier; located beneath concrete slabs.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* to be for used in the work of this section.

.3 Samples:

.1 Submit sample of proposed *Products* for review by *Consultant*.

.4 Manufacturer's instructions:

.1 Submit manufacturer's *Product* installation instruction for *Products* to be used in the work of this section.

.5 Vapour barrier test results and certification:

.1 Provide certification prepared by accredited testing company for test procedures listed in Table 1 of ASTM E1745-17 and paragraphs 7.1.2, 7.1.3, 7.1.4, and 7.1.5 of ASTM E1745-17. Provide the date of the most recent test and the test results for each test.

.1 Accompany certification tests specified above with letter signed by *Product* manufacturer attesting that material to be provided is of the same formulation and manufacture as the *Product* tested.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers: Minimum 5 years experience in application of *Products*.

.2 Mock-up:

.1 Construct 10 m² (100 ft²) area of typical installation for each type of *Product*.

.1 Construct mock-up of sheet vapour barrier installation including one lap joint, one edge termination, and one penetration. Mock-up may be part of finished work.

.2 Locate at the *Place of the Work* as part of final installation.

.3 Do not proceed until mock-up has been reviewed by *Consultant*.

.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

PART 2 - PRODUCTS

2.1 Materials

.1 Vapour barrier membrane:

.1 Performance criteria:

.1 Permeance, as tested after conditioning: not greater than 0.5700 ng/(Pa*s *m²)(0.010 perms (gm/ft²/in-Hg)) to ASTM E1745-17 paragraphs 7.1.2 through 7.1.5.

.2 Strength: Class A to ASTM E1745-17.

.3 Thickness of plastic: Minimum 0.38 mm (15 mils).

.2 Acceptable *Products*:

.1 Stego Industries 'Stego Wrap Vapor Barrier', thickness specified above.

.2 W.R. Meadows 'PERMINATOR', thickness specified above.

.3 Substitutions: in accordance with Section 01 25 00.

.2 Vapour barrier membrane joint tape:

.1 Pressure sensitive high density polyethylene tape, 100 mm (4") wide, product selection as per vapour barrier membrane manufacturer's written installation requirements.

.3 Penetration flashing:

.1 Vapour barrier membrane material and vapour barrier joint tape in accordance with manufacturer's written requirements.

PART 3 - EXECUTION

3.1 Installation

.1 Install vapour barrier membrane in accordance with below-grade vapour barrier manufacturer's written requirements and ASTM E1643-18a.

.2 Extend vapour barrier to the perimeter of the slab and seal to perimeter and penetration conditions. Seal around penetrations such as utilities and columns in order to create a monolithic membrane between the surface of the slab and moisture sources below the slab and at the slab perimeter.

.3 Install vapour barrier membrane using largest practicable sheet size to minimize joints over compacted fill.

.4 Inspect vapour barrier membrane sheets for continuity. Repair punctures and tears in vapour barrier membrane with sealing tape before work is concealed.

.5 Vapour barrier membrane installation shall be continuous and vapour tight.

.6 Overlap vapour barrier membrane joints 150 mm (6") minimum and tape seal with vapour barrier joint tape.

.7 Unroll vapour barrier membrane with longest dimension parallel with direction of concrete placement.

.8 Lap vapour barrier membrane up foundation walls a minimum of 100 mm (4") and tape seal with vapour barrier joint tape.

.9 Centre vapour barrier joint tape over vapour barrier membrane laps and joints. Keep area of tape adhesion free of dust, dirt, and moisture.

.10 Cut slit around pipes, ductwork, rebar, and wire penetrations to place the initial layer of vapour barrier membrane.

.1 Cut a piece of vapour barrier membrane minimum width of 300 mm (12"). The length should be 1 1/2 times the pipe circumference. With a roofer's knife or scissors, cut "fingers" half the width of the film.

.2 Wrap vapour barrier membrane around and tape the collar onto the pipe and completely tape fingers to the bottom layer of vapour barrier membrane with vapour barrier joint tape.

.11 In the event that vapour barrier membrane is damaged during or after installation, repair the membrane. Cut a piece of vapour barrier membrane large enough to cover damage by minimum overlap of 150 mm (6"). Clean adhesion areas of dust, dirt, and moisture. Tape down edges using vapour barrier joint tape.

3.2 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Inspection and testing:

.1 Independent inspection and testing company shall perform inspection of completed work.

.3 Manufacturer's field review to be in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Sheet-applied self-adhesive vapour impermeable air / vapour barrier membrane.

.2 Sheet-applied self-adhesive vapour permeable air barrier membrane.

.3 Sheet metal air/vapour barrier.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Compatibility statement:

.1 Submit manufacturer's compatibility statement validating compatibility of air barrier system materials with substrates and adjacent materials.

.4 Samples:

.1 Submit 305 mm (12") square samples of each type of air barrier membrane.

1.3 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Provide the work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.2 Mock-up:

.1 Construct minimum 10 m^2 (100 ft^2) area of each typical wall assembly installation for each type of *Product*.

.2 Locate at the *Place of the Work* as part of final installation. Space installation to include exterior wall panel incorporating window, glazing system and insulation.

.3 Do not proceed until mock-up has been reviewed by *Consultant*.

1.4 Delivery, Storage, and Handling

.1 Package materials and identify on attached labels the manufacturer, contents and material specification number.

.2 Store flammable solvent-base liquids away from excessive heat and open flame. Primer contains solvent. Do not use near open flame.

.3 Store surface conditioner at temperature above 5°C to facilitate handling.

.4 Store roll materials on end.

1.5 Field Conditions

.1 Provide forced air circulation during curing period for enclosed applications.

.2 Low temperature application:

.1 Perform adhesion test for membrane when ambient temperature is below -5°C.

.2 Proceed with work when temperature is (or predicted) to fall below -5°C ambient temperature only with the mutual documented agreement of independent inspection and testing company, manufacturer and applicator.

.3 Do not perform installation during rainy or inclement weather or on wet or frost covered surfaces.

.4 Provide temporary protection of the applied membrane to prevent mechanical damage or damage from spillage of oil or solvents.

1.6 Warranty

.1 The work of this section shall meet the specified building envelope performance requirements during the warranty period.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Air barrier system shall perform as continuous air barrier and as liquid-water drainage plane flashed to discharge to exterior of building envelope incidental condensation or water penetration.

.2 At wall and roof assembly transitions, air barrier system shall perform as continuous air barrier and as liquid-water drainage plane flashed to discharge to exterior of building envelope incidental condensation or water penetration by creation of unobstructed drainage plane that extends across the cladding transition or by flashing to discharge to exterior of building envelope incidental condensation or water penetration.

.3 Air barrier system shall accommodate substrate movement, construction material changes, and transitions at perimeter conditions without deterioration which permits air and water leakage exceeding the following specified limits and requirements, or interruption of the drainage plane:

.1 Air permeance of air barrier material: Maximum 0.02 L/s.m^2 at 75 Pa (0.004 cfm/ft^2 at 1.57 psf) to ASTM E2178-13.

.2 Rate of air leakage of air barrier system: Maximum 0.15 L/s.m^2 at 75 Pa (0.030 cfm/ft^2 at 1.57 psf) to ASTM E283-04.

.3 Water vapour transmission for air / vapour barriers: Maximum 5.7 ng/Pa.m^2.s. (0.1 perms).

.4 Water vapour transmission for vapour permeable air vapour barriers: Minimum 570 ng/Pa.m^2.s. (10 perms).

.5 Air barrier system structural performance while maintaining air barrier performance for air leakage: Air barrier system shall transfer wind loads to structure and shall resist design wind load in accordance with the building code.

.6 Low temperature performance: Minimum -30°C (-22°F).

.7 Compatibility: Air barrier system materials shall be compatible with substrate and adjacent materials with material manufacturers and show no performance deterioration during service conditions.

.8 Self-sealability: ASTM D1970/D1970M-21.

.4 Air barrier system shall be joined in an airtight and flexible manner to air barrier material of adjacent building envelope air barrier systems, allowing for relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between the following unless otherwise applicable:

.1 Foundation and walls.

.2 Walls and openings (windows, doors, louvres, and other wall penetrations).

.3 Wall and roof systems.

.4 Wall and roof over unconditioned space.

.5 Walls, floor and roof across construction, control, and movement joints.

.6 Walls, floors and roof to utility, pipe and duct penetrations.

2.2 Materials - General

.1 Single source responsibility: Materials shall be sourced from one manufacturer including sheet membranes, air barrier sealants, primers, mastics and adhesives.

2.3 Sheet-Applied, Vapour Impermeable Self-Adhesive Air/ Vapour Barrier Membrane System

.1 Description: Composite preformed modified bituminous membrane system consisting of SBS modified asphalt for low temperature flexibility and polyethylene scrim reinforcing, with physical properties as follows:

.1 Thickness: 1.0 mm (40 mils).

.2 Application temperature: in accordance with manufacturers written requirements.

.3 Primer: in accordance with manufacturers written requirements.

.4 Termination and penetration sealing mastic: in accordance with manufacturers written requirements.

.5 Acceptable product systems:

.1 Carlisle Coatings & Waterproofing ‘CCW 705’.

.2 GCP Applied Technologies ‘Perm-A-Barrier Wall Membrane’.

.3 Henry Company ‘Blueskin SA' and ‘Blueskin SA LT’.

.4 IKO ‘AquaBarrier AVB’ and AquaBarrier AVB Low Temp’.

.5 Soprema 'Sopraseal Stick 1100 T’.

.6 W.R. Meadows 'Air Shield' and ‘Low Temperature Air Shield’.

2.4 Sheet-Applied, Self-Adhesive Vapour Permeable Air Barrier Membrane System

.1 Description: Water resistive, vapour permeable, air barrier membrane consisting of a tri-laminate of two outer layers of modified polyolefin or polypropylene, bonded with permeable adhesive layer and split-back release film, complete with manufacturer's recommended primer. Membrane, with physical properties as follows:

.1 Weight: minimum 160 gm/m^2 (0.539 ounces/ft^2).

.2 Penetration and termination sealant: in accordance with manufacturers written requirements.

.3 Acceptable product systems:

.1 Dörken 'Delta-Vent SA'.

.2 Dörken 'Delta-Stratus SA'.

.3 Henry 'Blueskin VP 160'.

.4 Soprema 'Sopraseal Stick VP'.

.5 SRP Canada Inc. 'SRP AirOutshield SA280'.

.6 Vaproshield 'WrapShield SA'.

2.5 Sheet Metal, Air/ Vapour Barrier

.1 Sheet metal for metal/air vapour barriers and air seals: Minimum 0.91 mm (20 gauge) thick, sheet steel galvanized to ASTM A653/A653M-13, Designation G90/Z275.

.2 Sealant for sealing of metal air/vapour barrier: Single component silicone, to ASTM C920-14, Type M or S, Grade NS, Class 25.

.3 Dielectric Separator: Best grade, quick drying non-staining alkali resistant bituminous paint to CAN/CGSB 1.108-M89.

.4 Fasteners: Self-drilling, galvanized steel fasteners with neoprene washers.

PART 3 - EXECUTION

3.1 Installation - General

.1 Surfaces to receive air barrier systems shall be smooth, dry and free from conditions that will adversely affect execution, permanence, or quality of the work of this section.

.2 Air barrier system shall be continuous in the building envelope. Lap and seal air barrier systems in accordance with product manufacturer's written installation requirements to construction, control, and expansion joints, across junctions between different building assemblies, and around penetrations through the building assembly.

.3 Wrap into jamb, head and sill of building envelope window openings, door openings, and other openings with air barrier system membrane by returning membrane to inside face of opening unless otherwise indicated.

.1 Coordinate air / vapour barrier terminations of work of this section with air / vapour barrier membrane in Section 08 41 00.

3.2 Installation - Sheet Applied, Vapour Impermeable, Self-Adhesive Membrane

.1 Apply self-adhering membrane continuous to prepared and primed substrate in an overlapping shingle fashion to shed moisture towards exterior and in accordance with manufacturer's written requirements.

.2 At the end of each days work seal the top edge of the membrane where it meets the substrate using liquid air seal mastic. Trowel apply a feathered edge to seal termination and shed water.

.3 Apply self-adhering membrane continuous across junctions between different building assemblies, and around penetrations through the building assembly. Provide overlap in accordance with manufacturer's written requirements.

.4 Inspect membrane for punctures, misaligned seams and fishmouths, apply additional layer of membrane over affected area .

3.3 Installation - Sheet-Applied, Vapour Permeable, Self-Adhesive Membrane

.1 Apply self-adhering membrane continuous to prepared and primed substrate in an overlapping shingle fashion to shed moisture towards exterior and in accordance with manufacturer's written requirements.

.2 At the end of each days work seal the top edge of the membrane where it meets the substrate using liquid air seal mastic. Trowel apply termination mastic to a feathered edge to seal termination and shed water to seal termination and shed water.

.3 Apply self-adhering membrane continuous across junctions between different building assemblies, and around penetrations through the building assembly. Provide overlap in accordance with manufacturer's written requirements.

.4 Inspect membrane for punctures, misaligned seams and fishmouths, apply additional layer of membrane over affected area.

3.4 Installation - Sheet Metal Air /Vapour Barrier

.1 Apply sheet metal in an overlapping shingle fashion, staggering vertical joints. Form 10 mm (3/8") x 45 degree lips at lap joints and terminations and fill with sealant.

.2 Overlap sides and ends of sheet a minimum of 50 mm (2").

.3 Mechanically fasten sheet metal to supports at 200 mm (8") on centre.

.4 Ensure all projections, including wall ties, are properly sealed by using air barrier manufacturer's compatible sealant.

.5 Air barrier membrane to be complete and continuous from the wall to the roofing membrane system and waterproofing membrane system, around windows, aluminum screens, hollow metal door frames and spandrel panels.

3.5 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Manufacturer's field review to be in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Prefinished metal roofing system.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate with installers of wall mounted items, equipment, and mechanical and electrical work so that installation will not subvert the integrity of the cladding system.

.2 Coordinate interface, transition, lapping, flashings and compatibility of membranes with work of Section 07 27 00.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit engineered shop drawings.

.2 Indicate dimensions, cladding profiles, attachment and anchoring materials and methods, trim and closure pieces, fascia, material finishes and colours, and related work.

.3 Indicate methods to achieve watertight assembly, including sealants, penetration seals, drainage path of moisture from within assembly to exterior of envelope.

.4 Shop drawings; engineered for wind (uplift) loads:

.1 Submit engineered wind uplift design shop drawings in accordance with Section 01 33 00.

.2 Include description of materials and assemblies, and other pertinent information.

.3 Design uplift loads shall be indicated on the shop drawings.

.5 Design calculations; for wind (uplift) loads:

.1 Submit under seal, calculations prepared by the professional engineer responsible for the preparation of the engineered shop drawings that clearly indicate the following:

.1 Design assumptions.

.2 Codes and standards to which calculations are based upon.

.3 Materials.

.4 Maximum and minimum tolerances for proposed materials including anchors and spacing.

.5 Testing data to substantiate compliance with wind (uplift) design requirements.

.6 Samples:

.1 Submit 2 - 610 mm x 610 mm (24" x 24") size samples of cladding materials, of each colour and profile specified.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors: Execute the work of this section only by a *Subcontractor* who has adequate equipment, and skilled workers to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.2 Mock-ups:

.1 Before proceeding with final purchase of materials and fabrication of metal cladding components, prepare a mock-up of work. Incorporate materials and methods of fabrication and installation identical with project requirements.

.2 Install mock-up at location directed by *Consultant*.

.3 Provide mock-up of sufficient size and scope to show typical pattern of seams, fastening details, edge construction, and finish texture and colour.

1.5 Delivery, Storage, and Handling

.1 Store materials at temperatures recommended by manufacturer.

.2 Store bundles of panels raised on pallets, and sloped to drain.

.3 Package materials and identify on attached labels the manufacturer, contents and material specification number.

.4 Store flammable solvent-base liquids away from excessive heat and open flame. Primer contains solvent. Do not use near open flame.

1.6 Field Conditions

.1 Comply with CSSBI's installation requirements.

1.7 Warranty

.1 The warranty is a total system warranty. The metal cladding system shall meet both the specified system and the building envelope performance requirements during the warranty period.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Design to CAN/CSA S136-16 and building code.

.2 Design for expansion and contraction of component materials of the *Work* produced by an exterior surface temperature range of -35°C to +60°C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.3 Design cladding system to accommodate and withstand the following without permanent deformation or damage to, or failure of, cladding system or building structure:

.1 Deflection of cladding system due to uniformly distributed specified loads shall not exceed L/90 of the span for walls, nor L/180 of the span for roofs.

.2 Movement within cladding system, and between cladding system and building structure.

.3 Cladding system dead loads, snow loads, ice loads, and wind loads, and combinations thereof, in accordance with the building code.

.1 Design wind loads shall be based on at least 1/50 hourly wind pressure values as indicated in building code and greater values as required, to maximum allowable deflection without permanent deformation.

.4 Design to allow positive drainage of condensation occurring within cladding system to exterior of building envelope or drainage outlet.

.5 Design to allow positive drainage of water to exterior of building envelope or drainage outlet.

.6 Design metal systems to the Architectural Sheet Metal Manual by SMACNA unless otherwise indicated.

.7 Design wall system and secondary support structure to accommodate specified erection tolerances of the structure.

.8 Design system to meet tolerances specified.

.9 Roofing system: Prevent water from entering building and roofing assembly through roofing membrane.

2.2 Materials

.1 Preformed steel cladding; fabricated from preformed sheet metal as follows:

.1 Metal sheet:

.1 Zinc coated sheet steel: sheet steel to ASTM A653/A653M-13 with coating designation Z275 (G90) to ASTM A924/A924M-20 unless otherwise indicated.

.2 Aluminum-zinc alloy coated sheet steel: sheet steel to ASTM A792/A792M-10 with coating designation AZM180 (AZ60) to ASTM A924/A924M-20.

.3 Natural finish sheet metal: Aluminum-zinc alloy coated sheet steel: sheet steel to ASTM A792/A792M-10 with coating designation AZM180 (AZ60) to ASTM A924/A924M-20 and clear resin passivation coating.

.4 Preformed metal thickness: 0.61 mm (24 gauge) base steel nominal thickness.

.2 Accessories and hardware: Zinc coated steel to meet specified requirements of ASTM A123/A123M-13, hot dip galvanized after fabrication.

.3 Acceptable profile and colour:

.1 Profile to match VicWest 'TSR', natural finish.

.2 Sub-girts (z-girts): minimum 1.2 mm (18 gauge) zinc-coated steel to ASTM A653/A653M-13 with Grade A coating Z275.

.1 Adjustable.

.2 Notched for drainage.

.3 Thermal breaks at structural steel substrates: 3 mm (1/8") thick natural cork or neoprene.

.3 Accessories: exposed trim, end and flute closures, cap pieces, flashings, and the like, of same metal material and finish, and colour as prefinished metal panels, unless otherwise indicated.

.4 Waterproofing underlayment membrane: High temperature grade for use at locations where membrane is not protected by insulation:

.1 Description:

.1 Thickness: 0.76 mm (30 mils) minimum.

.2 Self-adhesive grade rubberized membrane backed by high density polyethylene.

.3 Primer for substrate.

.4 High temperature grade to resist softening at 105°C minimum.

.2 Acceptable *Products*:

.1 GCP Applied Technologies 'Grace Ultra'.

.2 Henry 'Blueskin PE 200 HT'.

.3 Soprema 'LASTOBOND SHIELD HT'.

.5 Slip sheet membrane: Triple layer, spun bonded polypropylene, breathable membrane with nominal weight of 170 g/m^2, nominal thickness of 0.6 mm (0.02") and water vapour transmission 59 perms in accordance with ASTM E96/E96M-13.

.1 Tape; weatherproofing membrane: as recommended by weatherproofing membrane manufacturer.

.2 Acceptable *Product*:

.1 SRP Canada Inc 'SRP-AirOutshield Roof'.

.2 VaproShield 'SlopeShield'.

.6 Exposed sealants: in accordance with Section 07 92 00.

.7 Gaskets: soft, pliable, cold weather grade, PVC foam, extruded profile for outer sheet.

.8 Fasteners:

.1 Self-drilling, Type 304 stainless steel.

.2 Head finish:

.1 Type 304 stainless steel, in concealed locations.

.2 Prepainted metal, colour to match prefinished metal panels in exposed locations.

.3 Nylon head, colour to match prefinished metal panels in exposed locations.

.3 For slip sheet membrane: Minimum No. 12-gauge (2.11 mm (0.019") shank diameter) corrosion-resistant steel or stainless steel nails having a minimum 9.5 mm (3/8") diameter head, or minimum No. 14 gauge (2.11 mm (0.083")shank diameter) corrosion-resistant steel or stainless steel nails having 25.4 mm (1") diameter caps, or minimum No. 16 gauge (1.65 mm (0.065") leg diameter) stainless steel staples having minimum 11.1 mm (7/16") crowns.

.9 Sheathing board (at metal decks): 6 mm (1/4") thick, glass mat faced exterior grade gypsum sheathing board, primed finish, 'Dens-Deck Prime' by Georgia Pacific or approved alternative.

.1 Sheathing board fasteners: No. 10 flat head, self tapping, Type A or AB, cadmium plated screws to CSA B35.3-1962.

2.3 Metal Finishes

.1 Prefinished sheet finish:

.1 Natural finish: Aluminum-zinc alloy finish with un-oiled, clear resin passivation coating surface treatment, ArcelorMittal 'Galvalume Plus'.

2.4 Fabrication

.1 Form to profiles indicated on drawings and to conform to reviewed shop drawings.

.2 Construct panel lines, breaks, and angles sharp and true, and surfaces free from warp and buckle.

.3 Allow for structural movements within the systems, and to accommodate thermal expansion and contraction between panels and structural members.

.4 Ensure that metal panels are free of steel contamination from rollers.

.5 Fabricate siding panel systems to prevent entry of water into building and from collection within system assembly.

.6 Join intersecting parts together to provide tight, accurately fitted joints with adjoining surfaces in true planes.

.7 Fabricate formed and notched metal closures to close-off flutes at exterior. Seal also with neoprene foam filler.

.8 Cooperate with applicable sections to ensure coordination required for proper installation of work of this section in conjunction with and incorporated with other work.

.9 Fabricate metal cladding panels in one length; maximum 6000 mm (20') for horizontal application; 12000 mm (40') for vertical application; unless otherwise indicated.

.10 Prefinished metal panel terminations shall not have a raw metal edge or exposed fasteners. Panel ends for non-corrugated panels shall be folded.

.11 Fabricate flashings used in conjunction with the metal roof with S-locks for concealed fastening unless otherwise specified.

PART 3 - EXECUTION

3.1 Examination

.1 Take measurements at the *Place of the Work* to ensure that the work of this section is fabricated to fit structure, surrounding construction, around obstructions and projections in place.

.2 Verify that backup construction is aligned for proper installation of prefinished metal panel system before commencing erection.

3.2 Sheathing Board

.1 Lay sheathing with tightly butted joints. Longitudinal joints must be at right angles to flute direction. Joints occurring along widths of board to be continuously supported on top flange of metal deck.

.2 Ensure sheathing is immediately protected with membrane.

.3 Mechanically fasten sheathing to steel deck with self-tapping, non-corroding screws, spaced evenly to each board and to only top flanges of steel deck.

3.3 Slip Sheet Membrane Installation

.1 Install in accordance with manufacturer's recommendations.

.2 Horizontal and vertical laps in accordance with manufacturers written requirements and to suit substrate conditions.

.3 Protect installed waterproofing membrane from damage due to ultraviolet light, harmful weather exposures, and physical abuse in accordance with the manufacturer's recommendations.

.4 Seal around materials penetrating membrane in accordance with manufacturer's written installation requirements.

3.4 Cladding System Installation

.1 Erect systems complete with flashings forming part of the system, clips, fasteners, closures and sealant to meet same design criteria as specified for fabrication.

.2 Erect panels in straight lines that are true, level, square, and plumb to comply with installation tolerances.

.3 Attachment system: Allow for free and noiseless vertical and horizontal thermal movement due to expansion and contraction for material temperature range. Buckling of panels, opening of joints, undue stress on fasteners, failure to sealants or any other detrimental effects due to thermal movement is not permitted. Allow for ambient temperature at time of fabrication, assembly and erection procedures.

.4 Anchor cladding securely per engineering recommendations and in accordance with reviewed shop drawings to allow for necessary thermal movement, wind loading and structural support.

.5 Install sealant between work of this section and work of other sections to meet specified requirements of Section 07 92 00 and to provide a watertight installation.

.6 Cut, flash, and apply sealant to system penetrations. Seal around materials penetrating metal cladding watertight.

.7 Install various components within cladding assembly to provide positive controlled drainage of moisture to exterior of building envelope or drainage outlet.

.8 Conceal fasteners.

.9 Do not install component parts that are observed to be defective, including warped, bowed, dented, and broken members.

.10 Obtain panel symmetry whenever possible relative to openings in both vertical and horizontal plane.

.11 Break form metal flashings to profile required, in maximum lengths.

.12 Install head and sill flashings, edge trim, cap pieces and other formed profiles as applicable and detailed.

.13 Apply sealant to face of supports for top and bottom closure flashings and at supports for perimeter closure flashings and returns.

.14 Do not cut, trim, weld or braze component parts during erection in manner that would damage finish, decrease strength or result in a visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

.15 Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

.16 Protect surface of metals in contact with concrete, mortar, plaster or other cementitious surface with isolation coating.

3.5 Metal Cladding Installation Tolerances

.1 Maintain the following installation tolerances:

.1 Maximum variation from plane or location shown on reviewed shop drawings: 20 mm (3/4")/10 m (32.8') of length and up to 30mm (1-1/6")/100 m (328') maximum.

.2 Maximum offset from true alignment between two adjacent members abutting end to end or side-by-side, in line: 1 mm (0.039").

.3 Flatness: Maximum deviation from flatness shall be 3.2 mm (1/8") in 1520 mm (5') on panel in any direction for assembled units.

3.6 Field Quality Control

.1 Quality control to be in accordance with Section 01 45 00.

3.7 Adjusting and Cleaning

.1 After erection, touch up coatings removed or damaged during erection.

.2 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

.3 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.

.4 Remove excess sealant with recommended solvent.

3.8 Protection

.1 Protect prefinished steel during fabrication, transportation, storage at the *Place of the Work* and erection, in accordance with CSSBI Standards.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Fibre reinforced cement panels including soffits.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate with installation of air barrier membrane, in accordance with Section 07 27 00, and insulation, in accordance with Section 07 21 00, to ensure complete continuity of air barrier and thermal barrier system for building.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit engineered shop drawings.

.2 Indicate panel installation, material, panel layout and accessories.

.3 Indicate dimensions, anchorage, profiles and *Product* components, trim and closure pieces, accessories, finish colours, patterns, textures, and related work.

.4 Samples:

.1 Submit 2 complete sets of colour swatches representing manufacturer's full range of colours, grain patterns, vein contrasts and materials for the purpose of colour selection by *Consultant*.

.2 Submit 4 - 610 mm x 610 mm (24" x 24") size samples of panel material, of colour selected by *Consultant*.

.3 Submit samples of accessories if requested by *Consultant*.

1.4 Closeout Submittals

.1 Submit required closeout submittals in accordance with Section 01 78 00.

.2 Submit manufacturer's *Product* data sheets covering care and recommended maintenance procedures for the *Products* of this section for incorporation into the operation and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors: Execute the work of this section only by a *Subcontractor* meeting the following qualifications:

.1 Has adequate plant, equipment, and skilled workers to perform it expeditiously.

.2 Is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.3 Is certified by the system manufacturer for installation of their system. Submit written certification to *Consultant* prior to commencing the work of this section.

.4 Panel cladding installation: shall be applied by applicator trained and approved by manufacturer for application of its *Products.*

.2 Mock-ups:

.1 Construct 10 m² (100 ft²) area of typical installation for acceptance, in location as directed by *Consultant*. Locate at the *Place of the Work* as part of final installation.

.2 Mock-up shall incorporate cladding, finishing accessories and adjacent materials including flashing and trim.

1.6 Delivery, Storage, and Handling

.1 Store materials in accordance with manufacturer's recommendations in unopened packaging until ready for installation. Store materials in covered area away from water, on flat, level surface with adequate support to prevent sagging.

.2 Protect materials during handling to prevent damage.

.3 Acclimatization:

.1 Boxes shall be opened and components removed from packaging and stacked flat with spacers between pieces in their final environment for a minimum of 3 to 4 days prior to installation and in accordance with manufacturer's recommendations.

1.7 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36 and as follows:

.1 Provide manufacturer's standard warranty. Duration: 10 years.

.2 Warranty is a total system warranty. The fibre reinforced cement panel system shall meet both the specified system and the building envelope performance requirements during the warranty period.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Design:

.1 Design cladding system to allow for thermal movement of component materials caused by ambient temperature range of -35°C to 80 °C without causing buckling, wind rattle, failure of joint seals, undue stress on fasteners or other detrimental effects.

.2 Design to accommodate, by means of expansion joints, movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.3 Design members and suspension system to withstand own dead load, snow wind loads, and wind uplift loads, or suction as calculated in accordance with the building code, to maximum allowable deflection without permanent deformation, using 1 in 50 year return.

.4 Design to accommodate specified erection tolerances of structure.

.5 Maintain the following installation tolerances: Maximum offset from true alignment between two adjacent members abutting end to end, in line: 1 mm (0.039").

.2 Performance:

.1 Comply with the following performance requirements:

.1 Metal fasteners shall be corrosion resistant.

.2 Provide drip detail over windows and door heads, copings, at edges of overhangs, to direct moisture to exterior.

.3 Wall system to utilize drain systems to positively drain water from within wall system to exterior.

2.2 Materials

.1 Fibre reinforced cement panels:

.1 Description: Fibre-reinforced cement panels without asbestos.

.2 Colours: Allow for 2 colours from manufacturer's standard range.

.3 Panel system:

.1 Acceptable *Products*:

.1 'Swisspearl 'Largo Carat''

.2 Equitone 'Natura'.

.4 Panel sizes: as indicated on drawings.

.5 Panel thickness: 12 mm.

.2 Thermally broken façade substructure:

.1 System shall provide façade substructure with the following attributes:

.1 Thermally broken.

.2 Meet requirements of the building code for non-combustible construction.

.3 Adjustable to permit façade alignment tolerances.

.4 Corrosion resistant performance.

.5 Suitable for rear ventilated rain screen façade design.

.2 Z-girt and sub-girts: Preformed Z275 galvanized metal sheet, 1.22 mm (18 gauge) minimum base steel nominal thickness, notched for drainage, to ASTM A653/A653M-13, Grade A.

.3 Z-girt shall be prepainted black for added corrosion resistance.

.4 Thermally broken spacer systems:

.1 Subject to compliance with the requirements of the *Contract Documents*, provide one of the following product systems:

.1 Engineered Assemblies 'T-Clip Thermally Broken Façade Substructure'.

.2 Exterior Technologies Group 'TAC System Thermal Spacer'.

.3 Cascadia Windows & Doors 'Cascadia Clip'.

.4 IsoClip 'Thermal Isolation Clip'.

.5 SFS 'NVelope System Brackets'.

.3 Rain deflection profile: Hard PVC, grey colour.

.4 Insect and vent screen: continuous stainless steel vent strips, located at top and bottom of wall panel system assemblies.

.5 Weather protection flashing at perimeter and panel joints: Black, EPDM membrane, 1.1 mm (45 mil) thick.

.6 Horizontal joint flashings: 0.5 mm (0.02") thick stainless steel L-flashing, powder coated finish.

.1 Colour: as selected by *Consultant* from manufacturer's standard range.

.7 Joint channels, trim and closure panels: prefinished aluminum.

.1 Finish: Powder coated black.

.8 Through wall membrane flashing: in accordance with Section 04 27 00.

2.3 Fabrication

.1 Shop fabricate panels to profiles indicated. Shop cut panels with cutting equipment recommended by panel manufacturer.

.2 Fabricate to conform to shop drawings, to allow for structural movements within the system, and to accommodate thermal expansion and contraction between panels and structural members.

.3 Construct panel lines, breaks, and angles sharp and true, and surfaces free from warp and buckle.

.4 Fabricate system to prevent entry of water into building and from collection within system assembly.

.5 Join intersecting parts together to provide tight, accurately fitted joints with adjoining surfaces in true planes.

.6 Cooperate with applicable sections to ensure all co-ordination required for proper installation of work of this section in conjunction with and incorporated with other work.

PART 3 - EXECUTION

3.1 Examination

.1 Take measurements at the *Place of the Work* to ensure that work is fabricated to fit structure, surrounding construction, around obstructions and projections in place, or as indicated, and to suit locations of services.

.2 Verify that backup construction is aligned for proper installation of work of this section before commencing erection.

.3 Notify *Consultant* in writing of conditions detrimental to proper and timely completion of work of this section. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 Installation

.1 Install sub-girt framing at spacing in accordance with manufacturer's installation requirements. Provide continuous framing at panel joints and at panel perimeters.

.2 Install flexible flashings, cap flashings, drip flashings, copings, trim, closures and corners, brake formed to shape as indicated on drawings.

.3 Apply prefinished metal flashing closure strips over framing at panel joints.

.4 Provide prefinished trim necessary to complete panel installation including openings, panel penetrations and transitions to adjacent wall systems.

.5 Drilled holes and screw fasteners for panels in accordance with manufacturer's written requirements. Use screw fasteners and equipment as recommended by panel manufacturer.

.6 Apply panels in straight, level and aligned lengths with clean shop cut edges and joints.

.7 Install panels with joints centred over framing.

.8 Fasten panels through pre-drilled oversized holes with fasteners and equipment in accordance with manufacturer's installation requirements. Do not drive fasteners at an angle.

.9 Install panels with joints over middle of wall framing. Secure panels to metal framing, leaving 8 mm (5/16") gap between panels and openings, as indicated, and in accordance with panel manufacturer's requirements.

.10 Keep minimum distance to corners and edges as recommended by the manufacturer.

.11 Install panels true to line and level with clean-cut edges and joints.

.12 Install screw fastenings in vertical and horizontal direction at a maximum spacing of 610 mm (24") on centre, or as required by manufacturer. Apply screws without pressure to panels.

.13 Obtain panel symmetry whenever possible relative to openings in both vertical and horizontal plane.

.14 Do not install component parts that are observed to be defective, including warped, bowed, dented, abraised and broken members.

.15 Do not cut or trim component parts during erection in manner that would damage finish, decrease strength or result in a visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, or for replacement with new parts.

.16 Where panels fit into accessories leave clearance for expansion.

.17 Allow for differential thermal and structural movement between systems and structure as well as between elements of system.

.18 Finished installation shall be properly secured, free of rattles, distortions, waviness, protrusions, damaged or chipped components.

3.3 Installation Tolerances

.1 Maintain the following installation tolerances:

.1 Maximum variation from plane or location indicated on reviewed shop drawings: 20 mm (3/4") / 10 m (32.8') of length and up to 30 mm (1-1/6") / 100 m (32.8) maximum.

.2 Maximum offset from true alignment between 2 adjacent panels abutting end-to-end, in line: 1 mm (0.039").

3.4 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Manufacturer's field review to be in accordance with Section 01 45 00.

3.5 Adjusting and Cleaning

.1 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 PVC roofing membrane, adhered.

.2 Cover board, mechanically fastened.

.3 Rigid polyisocyanurate insulation.

.4 Air/vapour barrier Membrane, loose laid.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate with Divisions 21, 22, and 23 to ensure that roof drains are suitable for roofing system design.

.2 Coordinate with installers of roof mounted items, equipment, and mechanical and electrical work at roof so that installation will not subvert the integrity of the roofing system.

.3 Coordinate with installation of air barrier at walls to ensure complete continuity of air barrier system for building. Roofing air barrier membrane to lap by 75 mm (3") minimum and terminate with wall system air barrier membrane.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

.2 The manufacturer shall meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the roofing assembly.

.3 Meet with *Consultant*, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

.4 Review methods and procedures related to roofing installation, including manufacturer's written requirements.

.5 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

.6 Examine substrates and existing conditions for compliance with requirements, including flatness and fastening.

.7 Review structural loading limitations of roof deck during and after roofing.

.8 Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

.9 Review governing regulations and requirements for insurance and certificates if applicable.

.10 Review temporary protection requirements for roofing system during and after installation.

.11 Review roof observation and repair procedures after roofing installation.

.12 Forecasted weather conditions.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Roofing manufacturer's warranty and design criteria:

.1 Submit roofing manufacturer's warranty specimen and warranty design criteria prior to commencement of roofing work.

.4 Shop drawings; engineered for wind (uplift) loads:

.1 Submit engineered wind uplift design shop drawings in accordance with Section 01 33 00.

.2 Include description of materials and assemblies, and other pertinent information.

.3 Design uplift loads shall be indicated on the shop drawings.

.5 Design calculations; for wind (uplift) loads:

.1 Submit under seal, calculations prepared by the professional engineer responsible for the preparation of the engineered shop drawings that clearly indicate the following:

.1 Design assumptions.

.2 Codes and standards to which calculations are based upon.

.3 Materials.

.4 Maximum and minimum tolerances for proposed materials including anchors and spacing.

.5 Testing data to substantiate compliance with wind (uplift) design requirements.

.6 Shop drawings; general details:

.1 Submit drawings showing locations of main joints, section of entire system, sections of each sleeve and penetration condition, flashing conditions, expansion joints and other fabrication information. Indicate membrane attachment system and layout where applicable.

.2 Submit shop drawings for sloped insulation layout.

.7 Roofing manufacturer's warranty sample and wind uplift compliance reports:

.1 Submit copy of completed roofing manufacturer's pre-installation notification form at least 10 *Working Days* prior to commencement of roofing installation.

.2 Submit copy of roofing manufacturer's warranty specimen and warranty design criteria for roofing system prior to commencement of roofing installation.

.3 Roofing assembly wind uplift compliance reports: Submit roof system assessment reports for applicable CSA A123.21 compliant roof assemblies required to meet requirements for indicated wind uplift pressures and indicated roofing assembly configurations.

.8 Certificates:

.1 Submit written confirmation signed by roofing assembly manufacturer certifying compliance with wind uplift and exposure performance requirements.

.1 Submit evidence of compliance with performance requirements.

.9 Samples:

.1 Submit samples complete with manufacturer's labels intact, of materials to be used for work of this section prior to commencement of work. Allowing ample time for review and acceptance by *Consultant* and roofing inspection company. Do not proceed with work until samples are accepted.

.2 Submit following samples, prior to ordering materials:

.1 Typical hot weld joint in 450 mm (18") long sample and 305 mm (12") square of each type of roofing material showing materials and colours.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's maintenance instructions for incorporation into the operation and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Manufacturers: Company specializing in manufacturing the *Products* specified in this section, with minimum 10 years experience.

.1 Manufacturer that is FM approved for roofing system identical to that used for this Project.

.2 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.1 Work of this section shall be installed by a *Subcontractor* that is a member in good standing of the Canadian Roofing Contractors Association (CRCA) and Ontario Industrial Roofing Contractors Association (OIRCA.

.2 *Subcontractor* must be trained and approved by membrane manufacturer. Submit *Subcontractor's* (including full-time site supervisor responsible for the roofing work on site) certification letter prepared by membrane manufacturer.

.1 Heat welding of laps shall be performed only by skilled welders who have successfully completed a course of instruction provided by membrane manufacturer.

.3 A qualified firm approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product and eligible to receive manufacturer's special warranty.

.2 Mock-ups:

.1 Prepare a mock-up of the work of this section in accordance with Section 01 45 00. Incorporate materials and methods of fabrication and installation identical with *Project* requirements. Install mock-up at roof area location directed by *Consultant*. Retain accepted mock-up of sufficient size and scope to show typical pattern of seams, fastening details, edge construction, and workmanship.

1.6 Delivery, Storage, and Handling

.1 Package materials and identify on attached labels the manufacturer, brand, contents, weight as applicable, and *Product* and specification numbers.

.2 Protect edges of roll goods from damage during handling, and store rolls on end to prevent flattening.

.3 Handle materials carefully to preclude damage. Follow manufacturer's recommendations.

.4 Keep materials and equipment free from debris, ice, snow and contaminants. Store adhesives and sealants between 16°C and 27°C.

.5 Provide protection to building surfaces during hoisting, or application of materials. Protect adjacent surfaces in an acceptable manner from damage, marking and soiling during installation of the work of this section.

.6 Do not store roofing materials on roof. Store them under cover while roofing work is not in progress.

1.7 Field Conditions

.1 Apply roofing only when ambient air and/or surface temperatures of the substrates in accordance with roofing membrane manufacturer's installation requirements.

.2 Confine equipment, material storage, and operations of workers to limits indicated by laws, ordinances, and permits.

.3 Progressively remove debris created by the execution of the work and dispose of same at appropriate disposal sites.

.4 Do not apply roofing system during inclement weather.

.5 Do not apply roofing system to dirty, dusty, wet, damp or frozen deck surface.

.6 Secure the work of this section in a safe and watertight fashion before the onset of inclement weather and at the end of each day's work.

.7 Store insulation under opaque, breathable and waterproof tarpaulins or sheds, and ventilated to prevent entrapment of moisture. Prevent compression of panels at any point and breakage of edges and corners.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.2 Roofing manufacturer total system warranty including the following:

.1 No water leakage.

.2 Labour, materials, and workmanship.

.3 No dollar limit.

.4 Non-prorated.

.5 No limitation for ponded water.

.6 15 year warranty duration.

.3 The warranty is a labour, material, and workmanship total roof systems warranty. The roof system shall meet the overall performance requirements of the *Contract Documents* and remain leak-proof during the warranty period.

.4 Membrane roofing system to be free of defects in labour, materials and workmanship resulting in leakage, failure to stay in place, undue expansion or shrinkage, deformation, splitting, cracking, delamination, wrinkling, ultraviolet deterioration, environmental deterioration, microbial deterioration, brittleness due to low temperature deterioration, deterioration due to compatibility with materials by this section and/or supplied by membrane manufacturer as required for the work.

PART 2 - PRODUCTS

2.1 Roofing System Manufacturer

.1 General:

.1 Single source responsibility: each roofing component to be by one manufacturer.

.2 Acceptable roofing system manufacturers:

.1 Carlisle Syntec.

.2 Johns Manville.

.3 Lexcan.

.4 Sika Sarnafil.

2.2 Performance/Design Requirements

.1 Roofing system shall include roofing system materials required to achieve roofing membrane manufacturer's warranty.

.2 Roofing system shall resist environmental and wind (uplift) loads, normal movement of structure, and effects of those loads in accordance with the building code, and the following:

.1 Roofing system assemblies shall have been successfully tested by a qualified testing agency to resist project roofing uplift pressures in accordance with the building code.

.1 CSA A123.21 compliant roof assembly with respect to wind uplift resistance.

.2 Wind uplift pressures: as indicated on structural drawings.

.3 Roof covering classification: Roof assembly shall have a Class A classification as determined in conformance with CAN/ULC S107-10 "Standard Methods of Fire Tests of Roof Coverings".

.4 Fire resistance: The roof assembly shall meet the conditions of acceptance of CAN/ULC-S126-14.

.5 Air barrier system shall accommodate substrate movement, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding the following specified limits and requirements:

.1 Air permeance of air barrier material: Maximum 0.02 L/s m^2 at 75 Pa (0.004 cfm/ft^2 at 1.57 psf) to ASTM E2178-13.

.2 Rate of air leakage of air barrier system: Maximum 0.15 L/s m^2 at 75 Pa (0.030 cfm/ft^2 at 1.57 psf) to ASTM E283-04.

.3 Water vapour transmission for air / vapour barriers: Maximum 5.7 ng/Pa.m^2.s. (0.1 perms).

.4 Pull-off strength of liquid or sheet applied membrane and laps: Cohesive or substrate failure permitted when tested to specified wind load. Air barrier system shall transfer wind load to structure and shall resist 100% of design wind load or minimum of 2.15 kPa (45 psf), whichever is greater.

.5 Low temperature flexibility: to -30°C (-22°F) to CGSB 37-GP-56M-1985.

.6 Air barrier system shall be joined in an airtight and flexible manner to air barrier material of adjacent building envelope air barrier systems, allowing for relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between the following unless otherwise applicable:

.1 Walls and openings.

.2 Across construction, control, and expansion joints.

.3 Penetrations.

2.3 Materials

.1 Single ply premoulded membrane:

.1 Feltback polyester reinforced polyvinyl chloride sheet, with UV light stabilizers, flame retardant, and lacquer dirt repellent coating, made with recycled PVC roofing membrane: ASTM D4434/D4434M-15, Classification Type III .

.1 Acceptable *Product*:

.1 Sarnafil 'Sikaplan -60, 1.5 mm (60 mils) thick.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Membrane colours: White.

.3 Membrane interply reinforcement: as recommended by manufacturer to suit installation and attachment methods. Roofing shall be mechanically fastened, and fully adhered at required locations.

.2 Installed membrane system shall allow for structural movement or deflection of building, and span cracks in substrate of 6 mm (1/4") wide or less which may occur after installation of membrane.

.3 Elastic sheet materials shall be compatible with other materials used to provide the complete system including adhesives, insulation, protection materials and expansion joints.

.2 Cover board:

.1 Factory primed glass mat faced exterior grade gypsum sheathing board, ASTM C1177/C1177M-13, factory primed.

.1 Acceptable *Product*:

.1 Georgia Pacific 'DensDeck Prime Roof Board with Eonic Technology'.

.2 Substitutions: in accordance with Section 01 25 00.

.3 Roof insulation, rigid isocyanurate insulation board:

.1 Closed-cell polyisocyanurate foam core integrally laminated to heavy, durable and dimensionally stable inorganic coated-glass facers, HCFC free, 138 kPa (20 psi) minimum compressive strength to ASTM D1621-16 (at 10% deformation), Isocyanurate, to CAN/ULC S704-11, CAN/ULC-S126-14, and CAN/ULC S107-10, product approved by roofing membrane manufacturer. LTTR – Long Term Thermal Resistance, using techniques from CAN/ULC S770-15 based on ASTM C1303/C1303M-15.

.1 Acceptable *Product*:

.1 Sika 'SarnaTherm'.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Tapered insulation: Provide tapered insulation where indicated, minimum slope of 2% unless otherwise noted.

.1 Acceptable *Product*:

.1 Sika 'SarnaTherm'.

.2 Substitutions: in accordance with Section 01 25 00.

.3 For fully adhered applications, use faced recover insulation surfacing or recover board to suit adhesion application requirements and meet wind uplift requirements.

.4 Air barrier membrane:

.1 Thickness: 0.25 mm (10 mils).

.2 Description:

.1 Loose laid vapour barrier.

.1 Acceptable *Product*:

.1 Sarnafil 'SarnaVAP'.

.2 Substitutions: in accordance with Section 01 25 00.

.5 Flashings:

.1 Metal flashings: type as recommended by PVC roofing manufacturer.

.6 Sealant: Two part polyurethane conforming to CAN/CGSB 19.24-M90, and containing no bituminous substances. Use "Sarnafil Multi-Purpose Sealant" by Sarnafil.

.7 Attachment components: type as recommended by PVC roofing manufacturer.

.8 Fastening accessories:

.1 Membrane fasteners and plates: to FM 4470-12. Fastener length to penetrate top flute of metal decking by a minimum of 19 mm (3/4") and maximum of 25.4 mm (1").

.2 Insulation fasteners and plates: to FM 4470-12. Fastener length to penetrate top flute of metal decking by a minimum of 19 mm (3/4") and maximum of 25.4 mm (1").

.3 Sheathing board fasteners:

.1 Flat head, self tapping, corrosion resistant coating, to FM 4470-12.

.2 Fastener plates where required to meet the requirements of Factory Mutual 4470 for wind uplift. Fastener length to penetrate top flute of metal decking by a minimum of 19 mm (3/4") and maximum of 25.4 mm (1").

.9 Metal termination bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 25 by 3.2 mm (1/8") thick; with anchors.

.10 Miscellaneous accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants and termination reglets, and accessories as recommended by PVC roof manufacturer.

.11 Wood blocking and plywood: in accordance with Section 06 10 53.

.12 Roof walkway pads: Polyester reinforced PVC membrane 2.4 mm (0.096") thick, colour to later selection by *Consultant*, slip-resistant surface.

.1 Acceptable Product:

.1 Sika 'Sarnatred'.

.2 Substitutions: in accordance with Section 01 25 00.

2.4 Fabrication

.1 Whenever practicable, factory fabricate and heat weld seams in sheets of sizes designated on reviewed shop drawings. Supply membrane sheets as large as possible to minimize field joints.

.2 Prefabricate where necessary, junctions and flashing upstands around penetrations and openings in membranes.

.3 Fabricate premoulded inside and outside corners with or without preformed cant sections for corners or field fabricated corners to manufacturer's requirements.

PART 3 - EXECUTION

3.1 Examination

.1 Before proceeding with application, ensure that:

.1 Roof deck is constructed smoothly; in true planes; and level, or sloped to drains, whichever is design intent.

.2 Roof deck is clean and sufficiently dry for application under specified warranty.

.3 Adjacent construction and installation of work is completed.

.4 Adjacent construction and installation of work of other sections incorporated with roof is completed.

.5 Roofing surfaces are free of cracks that are wider than bridging ability of roofing materials.

.6 Preparations have been made for bases on which equipment will be installed.

.7 Work that penetrates roof has been installed.

.8 Deck has been reviewed and accepted by *Consultant* and membrane manufacturer prior to start of roofing work.

3.2 General Installation Requirements

.1 Do roofing work in accordance with applicable recommendations in CRCA Roofing Specifications Manual, ASTM D4434/D4434M-15, and in strict accordance with manufacturer's written specifications and installation requirements, with greater requirements governing.

3.3 Preparation

.1 Immediately following acceptance of slopes, support and surface conditions of support decking, commence application.

.2 Examine materials over which work of this section is applied and ensure that roof decks are free of snow, ice, loose or adhering materials which would impair this work. Substrate shall be clean, dry and suitable for roofing application.

.3 Undertake spot levels in an approved manner to determine if there is any unevenness in roof decks which may result in ponding of water on completed roofing in excess of 12.7 mm (1/2") depth.

.4 Advise *Consultant* of areas requiring corrections and forward tabulation of results of spot levels.

.5 Roof surfaces shall be free of ponding water, ice, and snow.

.6 Do not proceed with roofing work until areas where water will pool or other surface defects are corrected to the acceptance of *Consultant.*

3.4 Installation

.1 Follow manufacturer's requirements using only compatible adhesives and compounds recommended by manufacturer in quantities and techniques so recommended. Install membrane sheets to layout and details shown on reviewed shop drawings.

.2 Welding method shall be hot air method only. Do hand welding, machine welding and progressive testing of seams in strict accordance with manufacturer's requirements.

.3 Carry membrane up perimeter walls to height shown. Lap and weld joints minimum 50 mm (2") for hand welding and minimum 100 mm (4") for machine welding. Machine weld wherever practicable.

.4 Extend membrane onto flashing flanges of deck drains and weld; make watertight. Lap end joints and seal.

.5 Extend roofing to outer edges of roof and up vertical surfaces at least 200 mm (8") above horizontal roofing, and full height beneath counter flashing and top of curb flashing.

.6 At flashing termination points and roof drains, incorporate manufacturer's recommended materials, adhesives, sealing strips, and stainless steel compression rings and accessories to ensure completely waterproof system sealed against windblown water or air infiltration. Ensure continuity and integrity of air seal membrane and sheet membrane roofing assembly.

.7 Flash at roof perimeter and penetrations through roof as detailed and conforming to manufacturer's standard details. Coordinate work of this section with metal counter flashings specified in Section 07 62 00.

.8 Provide continuity between vapour barriers of this section and of Section 07 27 00 by lapping membrane with same. Coordinate with Section 07 27 00.

3.5 Parapet and Projection Blocking

.1 Install plywood as detailed and required, at entire perimeter of roof and at projections. Support ends of plywood and fasten to substrate at a rate of 1 fastener per 0.2 m^2 ($2ft^2$).

.2 Install blocking at entire perimeter of roof and at projections and penetrations as detailed and required. Match height of blocking with height of insulation. Anchor blockings to deck 305 mm (12") on centre to resist a force of 2.5 kN/m (175 lb/ft) in any direction.

3.6 Installation of Air / Vapour Barrier

.1 Overlap all edges by 100 mm (4") and seal with butyl tape. Extend air/vapour barrier to perimeter and deck penetrations and seal to provide continuity of vapour envelope.

.2 Air/vapour barrier shall be sealed on the vertical surfaces and at roof penetrations.

3.7 Insulation Application

.1 Install rigid insulation boards with long side at right angle to deck flutes. Provide full support at ends. Cut and trim insulation boards to provide plain butt joints at perimeter, parapet and curbs. Lay insulation boards in parallel course, butted together in moderate contact without gaps, with staggered end joints. Lay rigid insulation in 2 layers with joints staggered. Place sloped insulation saddles at obstructions to roof drainage and as indicated; stagger joints over rigid insulation. Slope to drains, 2% minimum.

.2 Fastening system: in accordance with approved shop drawings.

.1 Adhesively applied insulation:

.1 Apply insulation to substrate or to adjoining board with specified adhesive applied in 50 mm (2") wide bands every 305 mm (12") or in 100 mm (4") diameter spots (9 spots per square metre) at a rate of 2 to 3 kg per square metre.

.2 Mechanically fastened insulation:

.1 Fasteners must be attached to steel deck's upper flutes and at spacing to meet performance requirements, in accordance with roofing manufacturer's installation requirements

.3 Offset board joints with successive board layers, minimum 300 mm (12"). Place tapered insulation where as indicated, in accordance with reviewed shop drawings.

.4 Install only as much insulation as can be covered with membrane roofing in the same day.

.5 Install insulation boards with edges in moderate contact without forcing and fill gaps greater than 6 mm (1/4") with insulation.

.6 Cut insulation to fit to blocking, upstands, and penetrations through roof; fill gaps greater than 6 mm (1/4") with insulation.

.7 Provide cut-offs by installing strip of air / vapour barrier membrane to seal sections of roofing to smaller sections, and at the exposed edges of insulation under at roof edges and vertical surfaces. Install water cut-offs between base sheet and air / vapour barrier to provide watertight separation to adjacent roofing section.

.1 Locate water cut-offs at 929 m² (10,000 sf) maximum sections.

3.8 Cover Board

.1 Firmly set the boards, long joints continuous and short joints staggered. Boards shall be evenly and tightly butted together.

.2 Vertical joints between boards and insulation shall be staggered, minimum 150 mm (6").

.3 Apply only as many boards as can be covered with base sheet in the same day.

.4 At parapets and curbs mechanically fasten cover board to substrate before installation of self-adhesive base flashings. Use 6.4 mm (1/4") overlay boards at these locations.

.5 Mechanically fastened cover board:

.1 Install in accordance with manufacturers written recommendations.

3.9 Fully Adhered System

.1 Install roofing membrane in accordance with roof membrane manufacturer's written requirements.

.2 Install premoulded membrane without folds or wrinkles. Follow roof manufacturer's layout drawings. Overlap membrane over lap line provided on membrane.

.3 Fully adhere roofing membrane, with no air pockets in accordance with roof manufacturer's installation requirements.

.4 Hot air weld overlaps according to membrane manufacturer's recommendations.

3.10 Mechanically Fastened System

.1 Unroll premoulded membrane and draw tight without folds or wrinkles. Follow manufacturer's layout drawings. Overlap membrane overlap line provided on membrane. Install fasteners and membrane plates midway between 25 mm (1") and 75 mm (3") lines provided along edge of membrane, at spacings indicated on shop drawings. Set self-drilling fasteners with torque controlled or depth locator equipment only. Hot air weld overlaps according to membrane manufacturer's recommendations.

.2 Weld free edge of flap to membrane to provide water tightness of fastening points. Make sure that ends of fastening bars are round and smooth. Fasten additionally in same manner around perimeter areas and roof penetrations.

3.11 Flashing Membrane

.1 Adhere flashing membrane with membrane adhesive to vertical areas and flashing. Using a lambs wool roller, coat substrate with adhesive at rate recommended by manufacturer and dry 1 hour, as required.

.2 Unroll flashing membrane in position. Coat underside of membrane with membrane adhesive at recommended rate and allow to dry tack. Press membrane to substrate and roll solidly in, removing air bubbles.

.3 Do not apply adhesive to lap area. Clean with recommended cleaner if necessary.

.4 Install a continuous strip of butyl tape between membrane flashings and cap flashings.

.5 Flashing membranes shall be mechanically fastened along the counter-flashed top edge in accordance with PVC membrane manufacturer's written requirements.

3.12 Junction Membrane with Vertical of Surfaces

.1 Where reglets are provided, terminate membrane in reglet, wedge with lead or compatible plastic grip-type wedges and fill with sealant and backing rod.

.2 Where no reglets exist on vertical surfaces, mechanically secure membrane with 25 mm (1") wide by 4 mm (0.157") thick continuous bar fastened 150 mm (6") on centre with stainless steel Type 302 fasteners. Where bars meet, a 6.4 mm (1/4") gap must be allowed and bar ends covered with 100 mm (4") strips of membrane. Fasteners shall be no more than 75 mm (3") from the ends of the bar. Seal at top junction with sealant. Ensure cut ends of bars are filed smooth before securing.

3.13 Walkway Membrane

.1 Place chalk lines on deck sheet to indicate location of the walkway.

.2 Roofing membrane to receive walkway membrane shall be clean and dry.

.3 Prepare roof substrate, fully adhere walkway membrane, and hot-air weld membrane perimeters, in accordance with roofing manufacturer's written requirements.

.4 Do not run walkway over membrane bars.

3.14 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

3.15 Adjusting and Cleaning

.1 Upon completion of work of this section, clean up surplus materials and debris attributable to this section.

3.16 Protection

.1 Fasten snow protection over roof membrane. Reinforce insulation with 19 mm (3/4") plywood adhered to same.

.2 Roofing membrane to receive snow protection shall be clean and dry.

.3 Chalk lines on the deck sheet to indicate the location of snow protection.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 TPO roofing membrane.

.2 Cover board.

.3 Rigid polystyrene insulation.

.4 Air/vapour barrier membrane, self adhered.

.5 Associated roofing accessories and products.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate with Divisions 21, 22, and 23 to ensure that roof drains are suitable for roofing system design.

.2 Coordinate with installers of roof mounted items, equipment, and mechanical and electrical work at roof so that installation will not subvert the integrity of the roofing system.

.3 Coordinate with installation of air barrier at walls to ensure complete continuity of air barrier system for building. Roofing air barrier membrane to lap by 75 mm (3") minimum and terminate with wall system air barrier membrane.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

.2 The manufacturer shall meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the roofing assembly.

.3 Meet with *Consultant*, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

.4 Review methods and procedures related to roofing installation, including manufacturer's written requirements.

.5 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

.6 Examine substrates and existing conditions for compliance with requirements, including flatness and fastening.

.7 Review structural loading limitations of roof deck during and after roofing.

.8 Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

.9 Review governing regulations and requirements for insurance and certificates if applicable.

.10 Review temporary protection requirements for roofing system during and after installation.

.11 Review roof observation and repair procedures after roofing installation.

.12 Forecasted weather conditions.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Roofing manufacturer's warranty and design criteria:

.1 Submit roofing manufacturer's warranty specimen and warranty design criteria prior to commencement of roofing work.

.4 Shop drawings; engineered for wind (uplift) loads:

.1 Submit engineered wind uplift design shop drawings in accordance with Section 01 33 00.

.2 Include description of materials and assemblies, and other pertinent information.

.3 Design uplift loads shall be indicated on the shop drawings.

.5 Design calculations; for wind (uplift) loads:

.1 Submit under seal, calculations prepared by the professional engineer responsible for the preparation of the engineered shop drawings that clearly indicate the following:

.1 Design assumptions.

.2 Codes and standards to which calculations are based upon.

.3 Materials.

.4 Maximum and minimum tolerances for proposed materials including anchors and spacing.

.5 Testing data to substantiate compliance with wind (uplift) design requirements.

.6 Shop drawings; general details:

.1 Submit drawings showing locations of main joints, section of entire system, sections of each sleeve and penetration condition, flashing conditions, expansion joints and other fabrication information. Indicate membrane attachment system and layout where applicable.

.2 Submit shop drawings for sloped insulation layout.

.7 Roofing manufacturer's warranty sample and wind uplift compliance reports:

.1 Submit copy of completed roofing manufacturer's pre-installation notification form at least 10 *Working Days* prior to commencement of roofing installation.

.2 Submit copy of roofing manufacturer's warranty specimen and warranty design criteria for roofing system prior to commencement of roofing installation.

.3 Roofing assembly wind uplift compliance reports: Submit roof system assessment reports for applicable CSA A123.21 compliant roof assemblies required to meet requirements for indicated wind uplift pressures and indicated roofing assembly configurations.

.8 Certificates:

.1 Submit written confirmation indicating roofing system to be provided including wind uplift design, specimen of warranty compliance with wind uplift and exposure performance requirements.

.2 Submit manufacturer's certification that *Products* proposed for use in the work of this section are physically and chemically compatible with each other.

.9 Samples:

.1 Submit samples complete with manufacturer's labels intact, of materials to be used for work of this section prior to commencement of work. Allowing ample time for review and acceptance by *Consultant* and roofing inspection company. Do not proceed with work until samples are accepted.

.2 Submit following samples, prior to ordering materials:

.1 Typical hot weld joint in 450 mm (18") long sample and 305 mm (12") square of each type of roofing material showing materials and colours.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's maintenance instructions for incorporation into the operation and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Manufacturers: Company specializing in manufacturing the roofing system specified in this section, with minimum 10 years successful experience.

.2 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.1 *Subcontractor* must be approved by membrane manufacturer. Submit applicator's certification letter prepared by membrane manufacturer.

.1 Heat welding of laps shall be performed only by skilled welders who have successfully completed a course of instruction provided by membrane manufacturer.

.2 Mock-up:

.1 Prepare a mock-up of the work of this section in accordance with Section 01 45 00. Incorporate materials and methods of fabrication and installation identical with *Project* requirements. Install mock-up at roof area location directed by *Consultant*. Retain accepted mock-up of sufficient size and scope to show typical pattern of seams, fastening details, edge construction, and workmanship.

1.6 Delivery, Storage, and Handling

.1 Package materials and identify on attached labels the manufacturer, brand, contents, weight as applicable, and *Product* and specification numbers.

.2 Protect edges of roll goods from damage during handling, and store rolls on end to prevent flattening.

.3 Handle materials carefully to preclude damage. Follow manufacturer's recommendations.

.4 Keep materials and equipment free from debris, ice, snow and contaminants. Store adhesives and sealants between 16°C and 27°C.

.5 Provide protection to building surfaces during hoisting, or application of materials. Protect adjacent surfaces in an acceptable manner from damage, marking and soiling during installation of the work of this section.

.6 Do not store roofing materials on roof. Store them under cover while roofing work is not in progress.

.7 Roofing membrane that has been exposed to the elements for 7 days or more shall be prepared in accordance with manufacturer's installation specifications.

1.7 Field Conditions

.1 Apply roofing only when ambient air and/or surface temperatures of the substrates in accordance with roofing membrane manufacturer's installation requirements.

.2 Confine equipment, material storage, and operations of workers to limits indicated by laws, ordinances, and permits.

.3 Progressively remove debris created by the execution of the work and dispose of same at appropriate disposal sites.

.4 Do not apply roofing system during inclement weather.

.5 Do not apply roofing system to dirty, dusty, wet, damp or frozen deck surface.

.6 Secure the work of this section in a safe and watertight fashion before the onset of inclement weather and at the end of each day's work.

.7 Store insulation under opaque, breathable and waterproof tarpaulins or sheds, and ventilated to prevent entrapment of moisture. Prevent compression of panels at any point and breakage of edges and corners.

.8 Provide protection for roof areas exposed to traffic during construction in accordance with roofing membrane manufacturer's specifications. Protection materials must be smooth and free of fasteners and splinters.

.9 Deleterious substances shall not be allowed to come in direct contact with the roofing membrane.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.2 Roofing manufacturer total system warranty including the following:

.1 No water leakage.

.2 Labour, materials, and workmanship.

.3 No dollar limit.

.4 Non-prorated.

.5 No limitation for ponded water.

.6 10 year warranty duration.

.3 The warranty is a labour, material, and workmanship total roof systems warranty. The roof system shall meet the overall performance requirements of the *Contract Documents* and remain leak-proof during the warranty period.

.4 Membrane roofing system to be free of defects in labour, materials and workmanship resulting in leakage, failure to stay in place, undue expansion or shrinkage, deformation, splitting, cracking, delamination, wrinkling, ultraviolet deterioration, environmental deterioration, microbial deterioration, brittleness due to low temperature deterioration, deterioration due to compatibility with materials by this section and/or supplied by membrane manufacturer as required for the work.

PART 2 - PRODUCTS

2.1 Roofing System Manufacturer

.1 General:

.1 Single source responsibility: each roofing component to be by one manufacturer.

.2 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

.1 Carlisle SynTec Incorporated.

.2 Firestone Building Products.

.3 Johns Manville.

.4 Lexcan limited.

2.2 Performance/Design Requirements

.1 Roofing system shall include roofing system materials required to achieve roofing membrane manufacturer's warranty.

.2 Roofing system shall resist environmental and wind (uplift) loads, normal movement of structure, and effects of those loads in accordance with the building code, and the following:

.1 Roofing system assemblies shall have been successfully tested by a qualified testing agency to resist project roofing uplift pressures in accordance with the building code.

.1 CSA A123.21 compliant roof assembly with respect to wind uplift resistance.

.2 Wind uplift pressures: as indicated on structural drawings.

.3 Roof covering classification: Roof assembly shall have a Class A classification as determined in conformance with CAN/ULC S107-10 "Standard Methods of Fire Tests of Roof Coverings".

.4 Fire resistance: The roof assembly shall meet the conditions of acceptance of CAN/ULC-S126-06.

.5 Air barrier system shall accommodate substrate movement, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding the following specified limits and requirements:

.1 Air permeance of air barrier material: Maximum 0.02 L/s m^2 at 75 Pa (0.004 cfm/ft^2 at 1.57 psf) to ASTM E2178-13.

.2 Rate of air leakage of air barrier system: Maximum 0.15 L/s m^2 at 75 Pa (0.030 cfm/ft^2 at 1.57 psf) to ASTM E283-04.

.3 Water vapour transmission for air / vapour barriers: Maximum 5.7 ng/Pa.m^2.s. (0.1 perms).

.4 Pull-off strength of liquid or sheet applied membrane and laps: Cohesive or substrate failure permitted when tested to specified wind load. Air barrier system shall transfer wind load to structure and shall resist 100% of design wind load or minimum of 2.15 kPa (45 psf), whichever is greater.

.5 Low temperature flexibility: to -30°C (-22°F) to CGSB 37-GP-56M-1985.

.6 Air barrier system shall be joined in an airtight and flexible manner to air barrier material of adjacent building envelope air barrier systems, allowing for relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between the following unless otherwise applicable:

.1 Walls and openings.

.2 Across construction, control, and expansion joints.

.3 Penetrations.

2.3 Materials

.1 Use only materials and components supplied or accepted by roofing membrane manufacturer.

.2 Single ply TPO membrane:

.1 Adhered locations:

.1 Polyester scrim reinforced thermoplastic-polyolefin (TPO) membrane in accordance with the following properties:

.1 ASTM D6878/D6878M-11a Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.

.2 Membrane thickness: 1.52 mm (0.060") minimum.

.3 Coating over scrim; weathering side: 0.381 mm (0.015") minimum.

.2 Membrane colour: White.

.3 Installed membrane system shall allow for structural movement or deflection of building, and span cracks in substrate of 6 mm (1/4") wide or less which may occur after installation of membrane.

.4 Elastic sheet materials shall be compatible with other materials used to provide the complete system including adhesives, insulation, protection materials and expansion joints.

.5 Provide factory pre-fabricated (by roofing membrane manufacturer) curb wrap corners, square tubing wraps, split pipe seals, and penetration flashings for respective detail conditions.

.3 Membrane coated flashings:

.1 Non-reinforced TPO membrane, 1.0 mm (0.04") thick, same colour as roofing membrane, heat welded to 0.61 mm (0.0239") (24 gauge) minimum thickness Z275 galvanized steel.

.4 Cover board:

.1 Factory primed glass mat faced exterior grade gypsum sheathing board, ASTM C1177/C1177M-13, factory primed.

.1 Acceptable *Products*:

.1 CGC Securock Brand - Coated Glass-Mat Roof Board'.

.2 Georgia Pacific 'DensDeck Prime Roof Board with Eonic Technology'.

.2 Substitutions: in accordance with Section 01 25 00.

.2 Extruded polystyrene board to CAN/ULC S701.1-17, Type 4, closed cell type, with integral high density skin.

.1 Thermal resistance: Long term aged RSI value of 0.87/25 mm.

.2 Board size: 610 mm x 2440 mm (24" x 48").

.3 Compressive strength: Minimum 240 kPa (35 psi).

.4 Water absorption: 0.7% by volume maximum, to ASTM D2842-12.

.5 Edges: Ship lapped.

.5 Air barrier membrane:

.1 Thickness: 1.0 mm (40 mils).

.2 Flexibility at -37°C to ASTM D1970/D1970M-21: Pass.

.3 Water vapour transmission: 2.86 ng/Pa.s.m^2 in accordance with ASTM E96/E96M-13.

.4 Description:

.1 Self-adhesive sheet membrane, specifically designed for applications where ambient temperature is between -1°C and 21.1°C, comprised of a spunbonded polyester fabric laminated to a thick layer of highly adhesive rubberized asphalt, and complete with manufacturer's recommended primer to suit substrate.

.6 Fastening accessories; in accordance with manufacturer's specifications:

.1 Membrane and insulation adhesives:

.1 As recommended by manufacturer of material being adhered.

.2 Sealant: Low VOC 250 g/L (8.8 oz/gal maximum), one-part, moisture curing, elastomeric polyether sealant providing rapid skin time when exposed to atmospheric moisture forming a waterproof rubber surface in less than an hour, product as recommended by roofing membrane manufacturer.

.3 Membrane fastening plates: 60 mm (2-3/8") diameter, to FM 4470-12.

.4 Insulation fastening plates: 75 mm (3") diameter, to FM 4470-12.

.5 Roofing nails: galvanized steel to CSA B111-1974, Table 12, and length sufficient to penetrate wood substrate 25 mm (1") minimum.

.7 Wood blocking and plywood: in accordance with Section 06 10 53.

PART 3 - EXECUTION

3.1 Examination

.1 Before proceeding with application, ensure that:

.1 Roof deck is constructed smoothly; in true planes; and level, or sloped to drains, whichever is design intent.

.2 Roof deck is clean and sufficiently dry for application under specified warranty.

.3 Adjacent construction and installation of work is completed.

.4 Adjacent construction and installation of work of other sections incorporated with roof is completed.

.5 Roofing surfaces are free of cracks that are wider than bridging ability of roofing materials.

.6 Preparations have been made for bases on which equipment will be installed.

.7 Work that penetrates roof has been installed.

.8 Deck has been reviewed and accepted by *Consultant* and membrane manufacturer prior to start of roofing work.

3.2 Preparation

.1 Immediately following acceptance of slopes, support and surface conditions of support decking, commence application.

.2 Examine materials over which work of this section is applied and ensure that roof decks are free of snow, ice, loose or adhering materials which would impair this work. Substrate shall be clean, dry and suitable for roofing application.

.3 Undertake spot levels in an approved manner to determine if there is any unevenness in roof decks which may result in ponding of water on completed roofing in excess of 12.7 mm (1/2") depth.

.4 Advise *Consultant* of areas requiring corrections and forward tabulation of results of spot levels.

.5 Do not proceed with roofing work until areas where water will pool or other surface defects are corrected to the acceptance of *Consultant*.

3.3 General Installation Requirements

.1 Perform roofing work in accordance with specifications, manufacturer's printed specifications and installation requirements, with greater requirements governing.

3.4 Installation

.1 Follow manufacturer's requirements using only compatible adhesives and compounds recommended by manufacturer in quantities and techniques so recommended. Install membrane sheets to layout and details shown on reviewed shop drawings.

.2 Welding method shall be hot air method only. Do hand welding, machine welding and progressive testing of seams in accordance with manufacturer's requirements.

.3 Probe seams once the hot air welds have thoroughly cooled (approximately 30 minutes) and repair gaps.

.4 Apply cut edge sealant on cut edges of roofing membrane (where the scrim reinforcement is exposed) after seam probing is complete.

.5 Carry membrane up perimeter walls to height shown. Lap and weld joints minimum 50 mm (2") for hand welding and minimum 100 mm (4") for machine welding. Machine weld wherever practicable.

.6 Extend membrane onto flashing flanges of deck drains and weld; make watertight. Lap end joints and seal.

.7 Extend roofing to outer edges of roof and up vertical surfaces at least 200 mm (8") above horizontal roofing, and full height beneath counter flashing and top of curb flashing.

.8 At flashing termination points and roof drains, incorporate manufacturer's recommended materials, adhesives, sealing strips, and stainless steel compression rings and accessories to ensure completely waterproof system sealed against windblown water or air infiltration. Ensure continuity and integrity of air seal membrane and sheet membrane roofing assembly.

.9 On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, provide daily seal to temporarily close the membrane to prevent water infiltration until roofing system is completed and watertight.

.10 Flash at roof perimeter and penetrations through roof as detailed and conforming to manufacturer's standard details. Coordinate work of this section with metal counter flashings specified in Section 07 62 00.

.11 Provide continuity between air/vapour barriers of this section and of Section 07 27 00 by lapping membrane with same. Coordinate with Section 07 27 00.

.12 Reduce thickness of insulation at roof drains by 13 mm (1/2") for a distance of 1220 mm (48") from each side of the drain. Factory cut and slope insulation at each drain to form a sump and to accommodate flashing immediately surrounding drain.

3.5 Parapet and Projection Blocking

.1 Install plywood as detailed and required, at entire perimeter of roof and at projections. Support ends of plywood and fasten to substrate at a rate of 1 fastener per 0.2 m^2 (2 ft^2).

.2 Install blocking at entire perimeter of roof and at projections and penetrations as detailed and required. Match height of blocking with height of insulation. Anchor blockings to deck 305 mm (12") on centre to resist a force of 2.5 kN/m (175 lb/ft) in any direction.

3.6 Air Barrier Membrane Application

.1 Ensure that air barrier membrane at roof edges and vertical building surfaces maintains, together with wall air barriers, integrity of total air barrier system for building envelope. Repair punctures of air barrier caused by subsequent work.

.2 Extend air barrier sufficiently to envelope the roof insulation a minimum of 200 mm (8") at cants, vertical walls, curbs and openings.

.3 Apply primer to substrates as manufactured by maker of air barrier in accordance with manufacturer's recommended rates and methods.

.4 Apply membrane over substrate in an overlapping shingle fashion in accordance with manufacturer's written requirements. Stagger vertical joints.

.5 Align and position membrane, remove protective film and press firmly into place. Ensure minimum 100 mm (4") overlap at ends and side laps, both sealed with mastic as recommended by manufacturer.

.1 Locate water cut-offs at 929 m² (10,000 sf) maximum sections.

3.7 Cover Board

.1 Firmly set the boards, long joints continuous and short joints staggered. Boards shall be evenly and tightly butted together.

.2 Vertical joints between boards and insulation shall be staggered, minimum 150 mm (6").

.3 Apply only as many boards as can be covered with base sheet in the same day.

.4 At parapets and curbs mechanically fasten cover board to substrate before installation of self-adhesive base flashings. Use 6.4 mm (1/4") overlay boards at these locations.

.5 Adhesively applied cover board:

.1 Apply insulation adhesive to underside and immediately bond cover board to substrate.

3.8 Fully Adhered System

.1 Install rigid insulation boards with long side at right angle to deck flutes. Provide full support at ends. Cut and trim insulation boards to provide plain butt joints at perimeter, parapet, curbs, etc. Lay insulation boards in parallel course, butted together in moderate contact without gaps, with staggered end joints. Lay rigid insulation in 2 layers with joints staggered. Place sloped insulation saddles at obstructions to roof drainage and as indicated; stagger joints over rigid insulation. Slope to drains, 2% minimum.

.2 Install roofing membrane without folds or wrinkles. Follow manufacturer's layout drawings. Overlap membrane over lap line provided on membrane. Fully adhere roofing membrane, with no air pockets in accordance with manufacturer's installation requirements. Hot air weld overlaps according to membrane manufacturer's recommendations.

3.9 Flashing Membrane

.1 Adhere flashing membrane with membrane adhesive to vertical areas and flashing. Using a lambs wool roller, coat substrate with adhesive at rate recommended by manufacturer and dry 1 hour, as required.

.2 Unroll flashing membrane in position. Coat underside of membrane with membrane adhesive at recommended rate and allow to dry tack. Press membrane to substrate and roll solidly in, removing air bubbles.

.3 Do not apply adhesive to lap area. Clean with recommended cleaner if necessary.

.4 Install a continuous strip of butyl tape between membrane flashings and cap flashings.

3.10 Junction of Membrane with Vertical Surfaces

.1 Where reglets are provided, terminate membrane in reglet, wedge with lead or compatible plastic grip-type wedges and fill with sealant and backing rod.

.2 Where no reglets exist on vertical surfaces, mechanically secure membrane with 25 mm (1") wide by 4 mm (0.157") thick continuous bar fastened 150 mm (6") on centre with stainless steel Type 302 fasteners. Where bars meet, a 6.4 mm (1/4") gap must be allowed and bar ends covered with 100 mm (4") strips of membrane. Fasteners shall be no more than 75 mm (3") from the ends of the bar. Seal at top junction with sealant. Ensure cut ends of bars are filed smooth before securing.

3.11 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Supply and installation of prefinished metal (steel) flashings.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 Shop drawings:

.1 Submit shop drawings including the following:

.1 Plans, elevations, sections, and attachment details.

.2 Detail fabrication and installation layouts, expansion-joint locations, and key details. Distinguish between shop and field assembled work.

.3 Include identification of material, thickness, weight, and finish for each item and location in the work.

.4 Include details for forming, including profiles, shapes, seams, and dimensions.

.5 Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.

.6 Include details of termination points and assemblies.

.7 Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contracting from fixed points.

.8 Include details of roof penetrations flashing.

.9 Include details of edge conditions, and counter flashings as applicable.

.10 Include details of special conditions.

.11 Include details of connections to adjoining work.

.3 Samples:

.1 Submit full-size samples of each specified flashing material formed to detailed profile including corner, curb, cap, and parapet flashing, and coping including lock-joints and hold-down clips.

.2 Submit 2 - 50 mm x 50 mm (2" x 2") samples of each type of sheet metal material, colour and finish.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors: Provide work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval of *Product* manufacturers.

.1 Sealant shall be applied by a *Subcontractor* of recognized standing, having preferably not less than 5 years of proven experience in this type of work, and who has the necessary equipment and skilled mechanics to carry out the work of this section satisfactorily and can substantiate this to satisfaction of *Consultant*.

.2 Quality standards:

.1 Quality of fabrication and installation of sheet metal work shall comply with recommendations published by National Roofing Contractors Association.

.3 Mock-ups:

.1 Provide on-site mock-up of the following:

.1 Coping flashing.

.2 Roof edge flashing.

.3 Counter flashing.

.4 Fascia flashing.

.5 Special flashing conditions.

.2 Include outside and inside corner condition with mitred joints, methods of joinery to prevent moisture infiltration, expansion and contraction.

1.5 Delivery, Storage, and Handling

.1 Comply with AAMA CW-10 – Care and Handling of Architectural Aluminum from Shop to Site.

.2 Keep materials and equipment free from debris, ice, snow and contaminants. Allow air to circulate around metal components, sheets and break shapes.

.3 Protect holes, and reglets from water and ice during freezing weather.

PART 2 - PRODUCTS

2.1 Prefinished Steel Flashing

.1 Sheet steel: Commercial quality to ASTM A653/A653M-13 with Z275 designation zinc coating.

.1 Minimum thickness: 0.61 mm (0.0239") (24 gauge).

2.2 Prefinished Metal Finishes

.1 Provide the following finish to exposed prefinished steel:

.1 Finish: factory prefinished CSSBI 10000 Series.

.1 10000 Series (Polyvinylidene Fluoride - PVDF) will not visibly (within 10 metres to the unaided naked eye) crack, chip, or peel (lose adhesion) for thirty-five (35) years from date of application. This does not include minute fracturing that may occur during the normal fabrication process. 10000 Series (Polyvinylidene Fluoride - PVDF) will not chalk in excess of a number eight (8) rating, in accordance with ASTM D4214-07(2015) method D659 at any time for thirty (30) years; will not change colour more than five (5.0) Hunter ΔE units as determined by ASTM D2244-21 at any time for thirty (30) years.

.2 Colour to later selection by *Consultant* from manufacturer's full range.

2.3 Accessories

.1 Isolation coating: to CAN/CGSB-1.108, bituminous type.

.2 Sealants:

.1 Exposed sealants: Silicone in accordance with Section 07 92 00, colour as selected by *Consultant* from manufacturer's full range.

.2 Concealed flashing sealants; hooked-type expansion joints with limited movement: Butyl sealant to ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.

.3 Cleats: of matching metal to flashing material, continuous, and of greater thickness than flashing material. Offset joints in cleats 305 mm (12") with joints in perimeter edge metal. Allow a 12.7 mm (1/2") gap between pieces.

.4 Fasteners:

.1 Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

.2 General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head:

.1 Exposed screws: 38 mm (1-1/2") long minimum at 450 mm (18") on centre maximum. Heads matching colour of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM washer under heads of exposed fasteners.

.2 Blind fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

.3 Cleat fasteners: Corrosion-resistant barbed angular ring or screw shank nail; length to achieve approximately 32 mm (1-1/4") penetration into nailer.

.3 Fasteners for prefinished aluminum sheet: Aluminum or Series 300 stainless steel.

.4 Fasteners for prefinished galvanized steel sheet: Series 300 stainless steel or hot dip galvanized steel to ASTM A153/A153M-09 and ASTM A653/A653M-13 Class G185.

.5 Fasteners and plates to meet the requirements of FM 4470-12 for wind uplift and corrosion resistance.

.5 Flexible flashing membrane; high temperature grade for use at locations where membrane is not protected by insulation:

.1 Description:

.1 Thickness: 0.76 mm (30 mils) minimum.

.2 Self-adhesive grade rubberized membrane backed by high density polyethylene.

.3 Primer for substrate.

.4 High temperature grade to resist softening at 105°C minimum.

.2 Acceptable *Products*:

.1 Henry 'Blueskin PE 200 HT'.

.2 Firestone 'Clad-Gard SA'.

.3 GCP Applied Technologies 'Ultra'.

.4 Soprema 'LASTOBOND SHIELD HT'.

.6 Flexible flashing membrane; standard temperature grade for use at locations where membrane is protected by material with insulating properties:

.1 Description:

.1 Thickness: 1 mm (40 mils) minimum.

.2 Self-adhesive grade rubberized membrane backed by high density polyethylene.

.3 Primer for substrate.

.2 Acceptable *Products*:

.1 Henry 'Blueskin Roof RF200'.

.2 GCP Applied Technologies 'Ice & Water Shield'.

.3 Soprema 'LASTOBOND SHIELD'.

2.4 Fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable SMACNA "Architectural Sheet Metal Manual (Seventh Edition) details and as indicated.

.2 Form pieces in 3048 mm (10 ft) maximum lengths. Make allowance for expansion at joints.

.3 Sealed joints: Form non-expansion but movable joints in metal to accommodate sealant.

.4 Expansion provisions: Form expansion joints of intermeshing hooked flanges, not less than 25.4 mm (1") deep, filled with butyl sealant concealed within joints.

.1 Joints that provide expansion and contraction capabilities should be located near the corners within approximately 610 mm (24") from each direction of the corner measured from the interior side.

.5 Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, and of greater thickness of metal being secured.

.6 Hem exposed edges on underside 12.7 mm (1/2"). Mitre and seal corners with butyl sealant.

.7 At parapets, provide 25.4 mm (1") minimum overlap between bottom of wood blocking or flashing anchorage support and edge of drip or termination of flashing.

.8 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.9 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

.10 Provide 25.4 mm (1") gap between drip edges and wall finish material to redirect water runoff away from walls.

.11 Provide 25.4 mm (1") minimum overlap between bottom of wood blocking or flashing anchorage support and edge of drip or termination of flashing.

.12 Shop fabricate inside and outside corners.

PART 3 - EXECUTION

3.1 Flexible Flashing Underlayment Installation

.1 Apply primer to concrete masonry and precast concrete substrates.

.2 Install in a consecutive weatherboard method starting at bottom or base of wall and working up.

.3 provide minimum of 50 mm (2") side laps and 75 mm (3") end laps.

.4 Cut to manageable lengths, position membrane for alignment, remove protective poly-film and firmly apply pressure to assure adhesion.

.5 Eliminate wrinkles or gaps, roll entire membrane surface (including seams) with a counter top or "J-roller" to ensure full contact and adhesion.

.6 Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the air barrier membrane and around the perimeter edge of membrane terminations.

.7 Flashing membrane shall be applied in weatherboard fashion starting at bottom of base of wall and working up, in and around the full perimeter of openings, to provide water tight protection and according to the following procedures:

.1 Apply the first strip horizontally immediately below the sill, cut it sufficiently long to extend past each side of the window, so that it projects even with the vertical jamb flashing to be applied later. Turn sill flashing up 50 mm (2") at ends of sill.

.2 Sill flashing shall overlap wall membrane. Overlap jamb at head flashing membrane in the same manner.

3.2 Roof Flashing Installation

.1 Install sheet metal work in accordance with SMACNA Architectural Sheet Metal Manual - Seventh Edition - 2012.

.2 Provide watertight flashing installing capable of resisting specified uplift pressures in accordance with roofing specifications, thermally induced movement and exposure to weather.

.3 Provide minimum 10% slope for drainage towards roof at parapet locations, with minimum 2% sloped to drain at remaining flashing locations.

.4 Provide continuous cleats for attachment of flashings at exterior face of wall and fasten at 150 mm (6") spacing and not less than 2 fasteners per cleat.

.5 Provide radius (3-piece) copings for curved wall condition unless otherwise indicated.

.6 Prefabricate corner copings in 610 mm (24") x 610 mm (24") shop fabricated and connected one pieces sections.

.7 Concealed fastenings and cleats, from view except where exposed flashings are accepted by *Consultant* prior to installation.

.1 Roof side fastening of copings shall be accomplished using either cleats or exposed colour matched screws with EDPM backed metal washers fastened through oversized holes in coping to allow for thermally induced movement and spaced at maximum spacing of 610 mm (24") centre to centre and not less than 2 fasteners per section of coping.

.8 Flash joints using S-lock forming tight fit over hook strips/cleats; unless otherwise indicated.

.9 Install surface mounted flared joint true and level, and caulk top of reglet with sealant at reglets.

.10 Insert metal flashings to other materials and flashings to form weather-tight junction.

.11 Provide prefinished metal flashing over equipment curbs which are covered with roofing membrane.

.12 Turn top edge of flashing into recessed reglet or mortar joint where indicated, to minimum depth of 25 mm (1"). Wedge flashing securely into joint. Seal flashing at reglet and cap flashing with sealant.

.13 Expansion provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 3048 mm (10 ft) and provide uniform joint spacing with no joints allowed within 610 mm (24") of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 25.4 mm (1") deep, filled with butyl sealant concealed within joints.

.14 Install flexible flashing membrane in accordance with manufacturer's written installation requirements.

3.3 Roof Drainage System Installation

.1 General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

.2 Scuppers for parapets: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and tie into roofing membrane.

3.4 Installation of Roof Accessories

.1 Incorporate devices to which roofing and flashing may be secured.

.2 Install work to ensure that roofing and flashings will be properly applied to maintain building envelope weather-tight.

3.5 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.1 Independent inspection and testing company shall perform inspection of completed work.

.2 The work of this section will be inspected and tested in conjunction with inspection and testing of roofing work.

3.6 Adjusting and Cleaning

.1 Remove deposits, stains or protections and wash metals left unpainted and exposed to view as recommended by manufacturer of metal or paint finish.

3.7 Protection

.1 Advise *Contractor* of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Materials installed in joints to restrict the spread of fire and smoke.

.1 Joints in or between fire-resistance-rated constructions.

.2 Perimeter fire barrier systems between fire-rated floor/roof and non-rated exterior wall assembly.

.1 Coordinate perimeter fire barrier system installation requirements with work of curtain wall assemblies.

.2 Section excludes:

.1 Firestopping and smoke seals, for mechanical, electrical and communications penetrations of fire resistant assemblies, and firestopping and smoke seals within their respective assemblies. Refer to Divisions 21, 22, and 23 and Divisions 26, 27, and 28.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate joint firestopping and smoke seal work with Section 01 33 00, paragraph 1.10 Project Firestopping Manual and Coordination.

.2 Coordinate with other sections to assure that pipes, conduit, cable, and other items that penetrate fire rated construction, have been permanently installed prior to installation of firestop assemblies.

.3 Schedule the *Work* to assure that penetrations and other construction that conceals penetrations are not erected prior to the installation of firestop and smoke seals.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets: Submit data and installation instructions for *Products* providing descriptions sufficient for identification at the *Place of the Work*.

.1 Materials list of *Products* proposed for use in the work of this section; complying with listed systems designs.

.2 Listing agency's detailed drawing showing joint assemblies and firestopping materials, identified with listing agency's name and number or designation, fire rating achieved, and date of listing.

.3 Certificates:

.1 Submit the following certification documents with closeout submittals:

.1 Manufacturer's certification: Submit manufacturer's certification that installed firestopping and smoke seal *Products* are suitable for the use indicated and comply with specified requirements.

.2 Installation certification: Installer shall submit certification that all joint firestopping system installations are completed and that installations comply with listed systems designs.

.4 Submit fire resistance rating test listings for firestopping and smoke seal systems.

.3 Shop drawings:

.1 Submit drawings indicating fire resistance rated assembly number, required temperature, hose stream, and flame rating, material thicknesses, installation methods and materials of firestopping and smoke seals, primers, supports, damming materials as applicable, reinforcements, anchorages, fastenings and methods of installation for each condition to be encountered.

.2 Designate on shop drawings static and dynamic joint systems, relative positions, expansion and control joints in rated slabs and walls, and firestopping details.

.3 Engineered shop drawings; for engineering judgements:

.1 Where *Project* conditions require modification to an accredited third party testing agency's listed system design to address a particular firestopping condition that is not covered by a listed system, submit engineered shop drawings detailing the modifications to the listed system design as an engineering judgment or equivalent fire-resistance-rated assembly, for each *Project* location and condition.

.2 Submit the manufacturer's engineering judgment identification number and shop drawing details prepared by a professional engineer. The engineering judgment submittal shall include both *Project* name, *Project* location, and *Subcontractor*'s name who will install firestop system as described in engineering judgement shop drawings.

.3 Provide complete details of specific application of listed system and its modifications upon which the engineered judgement is based upon.

.4 For perimeter fire barrier systems:

.1 Submit engineered shop drawings for engineering judgements covering perimeter fire barrier systems. Identify each cladding assembly type in contact with each perimeter fire barrier system.

.4 Manufacturers' instructions:

.1 Manufacturer of *Products* proposed for use in work of this section shall prepare firestopping manual scheduling products to be used for each assembly and installation required in the *Work*.

.1 Coordinate with project firestopping manual specified under Section 01 33 00.

.2 Manual shall include manufacturer's *Product* data sheets as specified under paragraph 1.3.2.

.3 Firestopping manual shall be submitted within 4 weeks of *Contract* award.

1.4 Quality Assurance

.1 Qualifications:

.1 Provide work of this section, executed by installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval, training and certification of *Product* manufacturers.

.1 Submit proof of manufacturer's installer certification for each installer of firestopping and smoke sealant systems.

.1 Manufacturer's willingness to sell its firestopping *Products* to the *Contractor* or to an installer engaged by the *Contractor* does not in itself confer qualification on the buyer.

.2 Applicator shall designate a single individual as *Project* foreperson who shall be present at the *Place of the Work* at all times throughout the work of this section when the work of this section is being performed.

1.5 Delivery Storage, and Handling

.1 Deliver materials to *Place of the Work* in manufacturer's unopened containers, containing classification label, with labels intact and legible at time of use.

.2 Store materials in accordance with manufacturer's recommendations with proper precautions to ensure fitness of material when installed.

.3 Do not use damaged or adulterated materials and materials exceeding their expiry date.

1.6 Field Conditions

.1 Comply with manufacturer's requirements relative to temperature and humidity conditions, before, during and after installation.

PART 2 - PRODUCTS

2.1 Manufacturers

.1 General: Manufacturers of firestopping and smoke seal system *Products* and installation specialists for the work of this section are limited to applicable assemblies as required for the *Work* and having listing mark on packaging.

.2 Subject to compliance with requirements, provide products by one of the following:

.1 3M Canada Inc.

.2 Hilti Canada Corp.

.3 NUCO Inc.

.4 STI Firestop.

.5 Tremco Commercial Sealants & Waterproofing.

2.2 Performance/Design Requirements

.1 Firestop and smoke sealant systems shall consist of material, or combination of materials installed to retain integrity of fire-rated construction by effectively impeding spread of flame, smoke, and/or hot gasses through perimeter joint or gaps, construction joints, or at perimeter fire containment in or adjacent to fire-rated barriers.

.2 Smoke sealants applied over firestopping materials or combination smoke seal/firestop seal material shall form air tight barriers to prevent passage of gas and smoke.

.3 Fire-resistance rating of firestopping system shall be equivalent to rating of adjacent floor, wall or other fire separation assembly.

.4 Firestopping system at fire rated assemblies with assembly STC rating requirements, shall provide STC rating equal to STC rating of fire rated assembly.

.5 Confirm locations of exposed/non-exposed firestopping/smoke seal surfaces with *Consultant* prior to application.

.6 Provide movement capability at movement joints in accordance with design requirements for movement joint.

.7 Head-of-wall joints; with dynamic designation:

.1 Joint assemblies to allow for vertical movement, allowing wall to move independent of structure, due to forces such as live loads, dead loads, thermal expansion/contraction, wind sway, without damaging the wall assembly or its fire protection components.

.1 Provide head-of-wall joints with dynamic designation.

.8 Regulatory requirements:

.1 Joint firestop systems shall be listed in accordance with CAN/ULC-S115-11 and shall achieve required fire resistance rating in accordance with building code.

.2 Proposed firestopping and smoke seal materials and methods shall conform to applicable governing codes having local jurisdiction.

2.3 Materials

.1 Single source responsibility for firestopping and smoke seal materials:

.1 Obtain firestopping and smoke seal materials from single manufacturer for each different *Product* required.

.2 Manufacturer shall instruct applicator in procedures for each material.

.2 Firestopping and smoke seal systems shall conform to the following:

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gasses in compliance with requirements of CAN/ULC-S115-11 and not to exceed opening sizes for which they are intended.

.2 Provide firestopping materials and systems with fire-resistance rating not less than the fire-resistance rating of applicable adjacent assembly.

.3 Listed in accordance with CAN/ULC-S115-11.

.4 Use only joint firestop systems that have been tested by an accredited third party testing agency for specific fire-rated construction conditions conforming to construction assembly type, joint type and fire-rating requirements for each separate instance.

.1 Where there is no specific third party tested and classified firestop system for a particular firestop configuration, submit engineered shop drawings.

.5 For joints in fire-separations, provide listed systems designs for the joint firestop and smoke seal systems as required by building code to maintain the integrity of the fire separations.

.6 *Products* shall be compatible with abutting dissimilar membranes, architectural coatings, finishes at floors, walls and ceilings. Check with requirements of *Contract Documents* and manufacturer of selected materials being installed.

.3 Smoke sealants for overhead and vertical joints shall be non-sagging; sealants for floors shall be self-levelling.

.4 Smoke seal sealant colour at exposed locations: Grey. (Red will not be accepted).

PART 3 - EXECUTION

3.1 Preparation

.1 Examine sizes, anticipated movement and conditions to establish correct thickness and installation of back-up materials.

.2 Prepare surfaces in accordance with manufacturer's written specifications and to requirements of listed system designs.

3.2 Installation

.1 Install joint firestopping and smoke seal systems in accordance with manufacturer's written requirements and in compliance with listed system designs. Products and installation requirements must comply with listed system designs.

.2 For materials that will remain exposed after completing the *Work*, finish to achieve smooth, uniform surfaces. Tool or trowel exposed surfaces.

.3 Notify *Consultant* when random completed installations are ready for review, as directed by *Consultant*, prior to concealing or enclosing firestopping and as applicable, smoke seals.

.4 Protect materials from damage on surfaces subjected to traffic.

3.3 Field Quality Control

.1 Conduct quality control to be in accordance with Section 01 45 00.

.1 Field tests and inspections:

.1 Examine completed firestop joint installations to ensure proper installation before concealing or enclosing areas. Keep areas of work accessible until inspections are completed.

.2 Inspection consultant to review installation of the work of this section and to perform random tests to verify its completion in accordance with the requirements of the *Contract Documents*.

.3 Give at least 48 hours notice before operations commence, and arrange for a pre-job conference with *Contractor*, installer, independent inspection and testing company, manufacturer, and *Consultant* present.

.4 Independent inspection and testing company shall examine installed firestopping in accordance with ASTM E2393-20. Independent inspection and testing company shall examine firestopping and shall determine, in general, that firestopping has been installed in accordance with requirements of the *Contract Documents* and in compliance with each listed firestop system design.

.5 Representatives of the manufacturer(s) shall have access to the *Work*. *Contractor* shall provide assistance and facilities for such access in order that the manufacturer(s) representative(s) may properly perform its function.

.2 Manufacturer's field review to be in accordance with Section 01 45 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Exterior building sealants.

.2 Interior building sealants.

.2 Section excludes:

.1 Roofing sealants.

.2 Tiling control joint sealants.

.3 Glazing sealants.

.4 Fluid-applied flooring sealants.

.5 Mechanical and electrical sealant work.

.6 Acoustical sealants.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate cleaning, priming and installation to avoid contamination of wet, freshly coated or adjacent finished surfaces.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 The following items shall be addressed at the pre-installation meeting:

.1 Analysis of the work and weather conditions.

.2 Shape factor of the joint.

.3 Recommendations for priming joints.

.4 Inspection of surfaces and joints.

.5 Compatibility of materials.

.6 Backing materials.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.2 Submit manufacturer's and *Product* name for each sealant which will be used in the *Work* prior to commencing the *Work*.

.3 Samples:

.1 Submit "wet sample" sealant colour samples for each sealant *Product* and colour.

.4 Test and evaluation reports:

.1 Test sealant in contact with samples of materials to be sealed to verify adhesion will be achieved and no staining of the material will result. Prepare sample joints at the *Place of the Work* of each type of sealant for each joint condition.

.1 Submit test results to *Consultant* prior to application of sealants.

.2 Test sealant in contact with samples of porous materials to be sealed to ensure that no staining of the material will result in accordance with ASTM C1248-18.

.1 Submit test results to *Consultant* prior to application of sealants.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers / applicators: Execute the work of this section only by a *Subcontractor* with minimum 5 years experience in application of *Products*, systems and assemblies specified. Installer to comply with quality assurance articles referenced in ASTM C1193-16 for installation of joint sealants.

.2 Mock-up:

.1 Submit 2440 mm (96") long sealant joint mock-up.

1.5 Field Conditions

.1 Conform to sealant manufacturer's specifications and recommendations.

.2 Verify substrates and ambient air temperature at the *Place of the Work* before, during and after application.

.3 Weather conditions: Do not apply silicone joint sealants in snow, rain, fog or mist, or when such conditions are expected.

1.6 Warranty

.1 Repair or replace joint sealants which fail to perform as air tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, or general durability; or appear to deteriorate or become unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship or in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.

.1 Defects shall include, but are not limited to:

.1 Staining from abutting materials or filler.

.2 Migrating, bleeding into, or staining abutting materials.

.3 Unsightly surface deformation.

.4 Excessive colour change, chalking, or dust pick-up.

.5 Failing adhesively or cohesively where maximum elongation is less than 25% of designed width of exposed joints.

.6 Hardening to more than 25% over specified hardness.

.2 For silicone sealants applied to porous substrates, provide *Product* non-stain sealant warranty for period of 20 years, against migrating, bleeding into, or staining abutting materials.

.3 For exterior exposed silicone sealants, provide 20 year *Product* material warranty.

PART 2 - PRODUCTS

2.1 Sealants

.1 General:

.1 Colours: Sealant colours shall match colours of adjacent materials, as selected and approved by *Consultant*.

.1 Colours shall be selected from manufacturer's full range of colours.

.2 Comply with ASTM C920-14 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C920-14 classifications for type, grade, class, and uses.

.3 For sealants to be applied to porous substrates: Provide products that have undergone testing according to ASTM C1248-18 and have not stained porous joint substrates indicated for *Work*.

.4 Sealant supplied shall not exude any material(s) which travels into adjacent materials, or travels onto surfaces of adjacent materials; causing damage, or attracting soiling, which becomes apparent during the service life of the building.

.2 Exterior sealants; joints in vertical and overhead surfaces:

.1 Sealant: single-component, non-sag, neutral cure, medium modulus low dirt pick-up and non-bleed, 100% inorganic silicone sealant, in accordance with the following:

.1 Comply with:

.1 ASTM C920-14, Type S, Grade NS, Class 50.

.2 SWR Institute Sealant Validation Program.

.2 Acceptable *Products*:

.1 DOWSIL '756 SMS'.

.2 Momentive GE 'SCS9000 Silpruf NB'.

.3 Exterior general sealants; horizontal trafficable joints:

.1 Sealant: one-component, medium modulus sealant in accordance with the following:

.1 Comply with:

.1 ASTM C920-14, Type M or S, Grade P, Class 25.

.2 CAN/CGSB 19.13-M87.

.2 Acceptable *Products*:

.1 DOWSIL 'CCS'.

.2 DOWSIL 'CWS'.

.3 Master Builders Solutions Canada 'Sonolastic SL 1'.

.4 Momentive GE 'SWS'.

.5 Sika 'Sikasil WS-305 CN[US]'.

.6 Sika 'Sikaflex 15LM'.

.7 Tremco, Inc. 'Vulkem 45/45 SSL'.

.4 Interior general sealants:

.1 VOC limit: less than 250 g/L.

.2 Interior sealant; at joints with painted gypsum board: one-component paintable acrylic or polyurethane sealant in accordance with the following:

.1 Comply with:

.1 ASTM C834-10.

.2 CGSB 19-GP-5M-1984.

.2 Acceptable *Products*:

.1 Sika 'Sikaflex 1A'.

.2 Tremco, Inc. 'Tremflex 834'.

.3 Interior sealant; at movement paintable joints in vertical surfaces: one-component polyurethane sealant in accordance with the following:

.1 Comply with:

.1 ASTM C920-11, Type M or S, Grade NS, Class 25.

.2 CAN/CGSB 19.13-M87.

.2 Acceptable *Products*:

.1 Master Builders Solutions Canada 'MasterSeal NP100'.

.2 Sika 'Sikaflex 15LM'.

.4 Interior sealant; at movement joints in vertical and overhead surfaces: one-component polyurethane sealant in accordance with the following:

.1 Comply with:

.1 ASTM C920-14, Type M or S, Grade NS, Class 25.

.2 CAN/CGSB 19.13-M87.

.2 Acceptable *Products*:

.1 Master Builders Solutions Canada 'MasterSeal NP1.

.2 Sika 'Sikaflex 15LM'.

.3 Tremco, Inc. 'Dymonic 100'.

.5 Interior sealant, mildew resistant one part silicone sealant in accordance with the following:

.1 Comply with:

.1 ASTM C920-14, Type S, Grade NS, Class 25.

.2 CAN/CGSB 19.22-M89.

.2 Acceptable *Products*:

.1 DOWSIL '786'.

.2 Master Builders Solutions Canada 'OmniPlus'.

.3 Momentive GE 'Sanitary SCS1700 Sealant'.

.4 Sika 'Sikasil GP'.

.5 Tremco, Inc. 'Tremsil 200'.

2.2 Accessories

.1 General: Provide joint sealants, primers, backings, and fillers that are compatible with one another and with joint substrates and other sealants or joint fillers specified and approved for applications indicated under joint sealant scheduled and under conditions of service and application as demonstrated by joint sealant manufacturer based on proven test results and field experience. When incompatible, inform *Consultant* and change to compatible type acceptable to *Consultant*.

.2 Cylindrical sealant backings: Provide joint backings that meet ASTM C1330-02, Type O (open-cell polyurethane), or Type B (non-absorbent bi-cellular backing materials with surface skin), sized 25 percent or greater than joint opening with proper density to control sealant depth and profile. Follow joint sealant manufacturer's recommendations with backing selections for optimum joint sealant performance, in accordance with the following schedule:

.1 Use open cell foam with non-absorbing closed cell skin (Sof-Rod) for vertical joints; round shape for open joints and triangular shape for angular joints.

.2 Use closed cell foam for horizontal joints.

.3 Bond-breaker tape: Polyethylene tape or other approved plastic tape as recommended by joint sealant manufacturer to prevent 3-sided joint adhesion to rigid, inflexible joint fillers or joint surfaces at back of joint where such adhesion would restrict proper sealant movement or result in sealant failure.

.4 Masking tape: Non-staining, non-absorbent and compatible with joint sealants and adjacent surfaces.

.5 Sealant primers: Use primers only as recommended by sealant manufacturer where required to enhance adhesion of sealant to specific joint substrates indicated and as determined for use from pre-construction mock-up testing. Select primers in consultation with sealant manufacturer and manufacturer of substrate material which do not have a detrimental effect on sealant adhesion or in-service performance.

.6 Cleaners for nonporous surfaces:

.1 Provide non-staining, chemical cleaners of type which are acceptable to manufacturer of sealant and sealant backing material, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

.2 Provide cleaner conditioner required for glass and glazed surfaces as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 Manufacturer's Recommendations

.1 Unless specified otherwise herein, comply with the recommendations and directions of the manufacturer whose materials are being used in the work of this section.

3.2 Preparation

.1 Protect adjacent work areas and finished surfaces from damage during joint sealant installation.

.2 Clean and prepare joint surfaces and substrates of substance that could impair the bond of joint sealants immediately before installing joint sealants.

.3 Provide a dry, dust-free and cleaned substrate for optimum results.

.4 Clean porous joint surfaces by using heavy-duty brushing, light abrasive, mechanical abrading or combination of these methods to produce a clean, sound surface for optimum bond with joint sealants per manufacturer's recommendations.

.5 Non-porous surfaces shall be cleaned using the two-cloth wipe method as referenced in ASTM C1193-16 and outlined by joint sealant manufacturer's written requirements.

.6 Rusting or scaling surfaces shall be prepared using abrasive cleaning methods as recommended by joint sealant manufacturer prior to joint sealant installation. Efflorescence, mould, mildew and algae must be removed and neutralized prior to joint sealant installation.

.7 Prepare finish-coated surfaces per joint sealant manufacturer's specific recommendations.

.8 Test materials for indications of staining or poor adhesion before any sealing is commenced. Submit reports in writing to *Consultant* of results.

3.3 Masking

.1 Where necessary to prevent contamination or marring surfaces of adjacent materials, mask areas adjacent to joints with masking tape prior to priming or sealing application. Remove tape immediately after joint has been completed and an initial set achieved.

3.4 Installation

.1 Apply joint sealants for continuous waterproof sealant joint protection. Vertical joints shall be lapped over horizontal joints as recommended by sealant manufacturer. Comply with installation recommendations in ASTM C1193-16 for use of joint sealants as applicable to each specific sealant installation.

.2 Install sealant primers only when recommended by sealant manufacturer and demonstrated at pre-construction tests after joint surface preparation has been completed and when surfaces are verified as clean and dry. Allow any primer installation to completely dry or cure prior to installation of backing or joint sealants. Primer is mandatory for gun applied sealants.

.3 Install joint sealants using proven techniques that comply with the following and in proper sequence with installation of primers and backings.

.1 Using proper joint sealant dispensing equipment, place sealants by pushing sealant beads into opening to fully wet-out joint sealant substrates. Fill sealant joint opening to full and proper configuration.

.2 Install, providing uniform cross-sectional shapes and depths in relation to joint width for optimum sealant movement capability per joint sealant manufacturer's written requirements.

.4 Joint sealant tooling is required for non-sag joint sealant installations. Immediately after placing fresh sealants and before skinning or curing begins, tool sealants using metal spatulas designed for this purpose in accordance with manufacturer's recommendations. Provide a smooth, uniform sealant finish, eliminating air pockets and ensuring good contact for optimum sealant adhesion within each side of the joint opening.

.1 Provide concave joint configuration as indicated per figure 5-A in ASTM C1193-16 unless otherwise indicated.

.2 Use tooling agents that are approved in writing by sealant manufacturer and that do not discolour sealants or adjacent surfaces.

.3 Remove excess sealant from surfaces adjacent to joint openings using metal spatula, promptly cleaning any sealant residue from adjacent finished surfaces. Remove masking after joint sealant is installed.

.5 Allow single-component sealants to fully cure before adhesion testing is performed as recommended by joint sealant manufacturer.

.6 Match approved sealant mock-up for colour, finish and overall aesthetics. Remove, refinish or re-install work not in compliance with the *Contract Documents*.

.7 When surfaces of adjacent materials are to be painted, perform sealant work before these surfaces are painted.

.8 Check form release agent used on concrete for compatibility with primer and sealant. If they are incompatible inform *Consultant* and change primer and sealant to compatible type, or clean concrete to sealant manufacturer's acceptance.

.9 Install joint backing material, filler strips, gaskets, bond breakers and similar type material of comparable performance characteristics. Install bond breaker tape or packing over asphalt impregnated fibre board as recommended by sealant manufacturer.

.10 Where joints are 12.7 mm (1/2") or deeper, insert backing material in continuous uniform compression with setback from finished face of adjoining materials equal to required depth of sealant (width/depth ratio) as specified herein.

.11 On horizontal traffic surfaces, support joint filler against vertical movement which might result from traffic loads, including foot traffic.

.12 Install bond breaker tape in bottom of joints in lieu of sealant backing where proper depth cannot be obtained when backing is installed.

.13 Maintain correct sealant depth. Sealant depth shall be 1/2 the width of the joint, maximum depth shall be 12.7 mm (1/2"), minimum depth shall be 6 mm (1/4"). Comply with manufacturer's written recommendations.

.14 Fillet bead sealant joints to be sized to provide proper contact area with substrates, in accordance with manufacturer's written recommendations.

.15 Apply sealants using pressure-operated guns fitted with suitable nozzles in accordance with manufacturer's directions. Apply sealants in such manner as to ensure good adhesion to sides of joints and to completely fill voids in joints.

.16 Apply sealants so that surfaces of joints are smooth, full bead, free from ridges, wrinkles, sags, air pockets and embedded impurities. Tool sealant surfaces to produce a smooth surface.

.17 Install sealant with exterior face of sealant set back 10 mm (3/8") from face of adjacent materials at building movement joints, unless otherwise indicated.

.18 Do not apply sealants to areas where installation of paints, coatings or flooring is in progress. Apply sealants after such work is complete and fully cured.

3.5 Exterior Sealant Schedule

.1 Include in work of this section joint sealants in exterior assemblies to seal open joints in surfaces exposed to view, and to make building weather-tight, as indicated, and as otherwise specified, except where specified under the work of other sections.

.2 Exterior sealant work is part of the work of this section. Install sealant to:

.1 Perimeters of exterior openings where frames/glazing meet exterior facade of building.

.2 Movement and control joints in exterior surfaces of insitu concrete and masonry.

.3 Exterior joints between masonry and insitu concrete.

.4 Exterior joints in horizontal wearing surfaces.

.5 Perimeters of louvres.

.6 Perimeters of mechanical and electrical penetrations including but not limited to outlets and electrical boxes.

.7 Install exterior non-bleed silicone sealant to architectural concrete form tie wire holes.

3.6 Interior Sealant Schedule

.1 Include in work of this section sealants to seal open joints in surfaces exposed to view, and to make building weather-tight and air-tight, as applicable, as indicated, and as otherwise specified, except where specified under the work of other sections.

.2 Install sealant to:

.1 Movement and control joints on exposed insitu concrete walls.

.2 Interior control and expansion joints in floor and wall surfaces.

.3 Raked out joints at junctions of masonry with concrete walls and columns, and at intersection of masonry walls and partitions where joint reinforcement is installed.

.4 Perimeters of exterior and interior door and window frames.

.5 Joints at tops of non-load bearing masonry walls at the underside of insitu concrete.

.6 Exposed interior control joints in gypsum board.

.7 Millwork junctions with walls.

.3 Mildew resistant sealant at wet areas:

.1 Perimeter joints of wet fixtures such as:

.1 Urinals.

.2 Water closets.

.3 Janitor sinks.

.2 Counter/wall junctions at countertops.

3.7 Miscellaneous Sealant

.1 Install exterior non-bleed silicone sealant to architectural concrete form tie wire holes.

3.8 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

3.9 Adjusting and Cleaning

.1 Remove droppings and clean off excess sealant or sealant residue adjacent to sealant joint installations as the work progresses by methods approved by joint sealant manufacturer before material achieves initial set.

.2 Do not damage adjacent surfaces with harmful removal techniques and protect finished surfaces beyond those that have been masked.

.3 Remove and replace damaged joint sealants.

.4 Remove temporary coverings and masking protection from adjacent work areas upon completion.

3.10 Protection

.1 Protect installed sealants during and after final curing from damage resulting during construction.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Hollow metal doors and panels (steel doors).

.2 Metal frames (steel frames, transom frames).

.3 Thermally broken metal door frames (thermally broken steel frames).

.4 Metal frames (steel frames for screens, sidelights).

1.2 Administrative Requirements

.1 Coordination:

.1 Cooperate fully with finish hardware distributor's representative during preparation of shop drawings and execution of shop fabrication.

.2 Coordinate installation of doors and frames with installation of hardware specified in Section 08 71 00.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 Submit copy of NAAMM-HMMA 840-17 standard.

.3 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.4 Shop drawings:

.1 Include details of each door and frame type, finish hardware types and locations, frame profiles, door and frame elevations, mitre details, fire protection rating, glazing preparation details and anchor details and locations.

.2 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.

.3 Electrified hardware requirements and preparations shall be clearly indicated on shop drawings.

.5 Samples:

.1 Submit cut-away sample door, with provision for lockset and hinge, and corner section of frame.

1.4 Quality Assurance

.1 Qualifications:

.1 Manufacturers:

.1 Provide doors and frames manufactured by a firm specializing in the design and production of hollow metal steel doors and frames.

.2 Manufacturer shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA).

.2 Mock-up:

.1 Provide mock-up of door and frame assembly for each door types.

.2 Mock-up may be incorporated in the completed work upon acceptance of *Consultant*.

1.5 Delivery, Storage, and Handling

.1 Inspect materials thoroughly upon receipt and report immediately discrepancies, deficiencies and damages, in writing, to *Supplier*.

.2 Note damages incurred during shipment on carriers' bill of lading and report immediately, in writing, to *Supplier*.

.3 Store materials properly on planks, out of water and covered to protect from damage from adverse weather conditions. Remove wet packaging immediately.

.4 Remove wrappings or coverings from doors upon receipt at the *Place of the Work*, and store in a vertical position, spaced with blocking to permit air circulation between them.

1.6 Warranty

.1 Repair or replace steel doors and frames that fail within the specified warranty period.

.2 Failures shall include but not be limited to out of true alignment, failure to operate and swing freely, smoothly, and easily, to remain stationary at any point, to close evenly and tightly against stops without binding, and to latch positively when doors are closed with moderate force. The warranty includes re-installation of hardware, re-hanging and fitting.

PART 2 - PRODUCTS

2.1 Manufacturer

.1 All Steel Doors 2000 Ltd.

.2 Apex Industries Inc.

.3 Artek Door (1985) Ltd.

.4 Daybar Industries Ltd.

.5 Fleming-Baron Door Products.

.6 M.J. Daley Manufacturing Co. Ltd.

.7 Trillium Steel Doors Limited.

.8 Vision Hollow Metal Limited.

2.2 Performance/Design Requirements

.1 Exterior insulated metal doors shall be tested to meet an operable U-value of 0.450.

.2 Fire rating requirements:

.1 Fire rated labelled doors and frames: tested to CAN/ULC-S104-15 and listed by a nationally recognized agency having a factory inspection service and shall be constructed as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.2 Install fire labelled steel door and frame products in accordance with NFPA 80-2013, except where indicated otherwise.

2.3 Materials

.1 Steel:

.1 Fabricated from tensioned levelled steel to ASTM A924/A924M-20, galvanized to ASTM A653/A653M-13, Commercial Steel CS, Type B.

.2 Steel shall be free of scale, pitting, coil breaks, surface blemishes, buckles, waves, and other defects.

.3 Minimum sheet thickness; uncoated steel sheet: in accordance with Appendix 1 of ANSI/NAAMM HMMA 861-14 "Guide Specifications for Commercial Hollow Metal Doors and Frames".

.4 Finish: Minimum Galvanneal coating designation ZF120 (A40).

.2 Door core materials:

.1 Honeycomb: Structural small cell 25 mm (1") maximum kraft paper 'honeycomb'. Weight: 36.3 kg (80 lb) per ream (minimum). Density: 16.5 kg/m^3 (1.03 pcf) minimum, sanded to required thickness.

.2 Polyisocyanurate: Closed cell, faced board, conforming to ASTM C1289-17.

.3 Adhesives:

.1 Heat resistant, single component, polyurethane reactive (water) hot melt, thermoset adhesive.

.2 Rigid insulation cores: Heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Lock seam doors: fire resistant, resin reinforced polychloroprene, high viscosity sealant-adhesive.

.4 Primer: rust inhibitive for touch-up.

.5 Finishing hardware: in accordance with Section 08 71 00.

.6 Miscellaneous:

.1 Door silencers: single stud rubber or neoprene type.

.2 Exterior top caps: Rigid polyvinylchloride extrusion.

.3 Frame thermal breaks: Rigid polyvinylchloride extrusion.

.4 Channel glazing stops and glazing trim: formed channel of minimum 0.81 mm (0.032") (20 gauge) steel, 15.9 mm (5/8") high.

.5 Kickplates: in accordance with Section 08 71 00.

2.4 Fabrication - General

.1 Fabricate steel doors, frames, transoms, sidelights and borrowed lights as applicable, to the design and dimensions indicated. Take field measurements where coordination with adjoining work is necessary.

.2 Fabricate steel doors and frames to be rigid, neat in appearance and free from defects, warp, wave or buckle with all corners square unless otherwise indicated.

.3 Operating clearances:

.1 Provide clearance at floor with allowance made for indicated finish flooring materials.

.2 Clearances for Fire-Rated Doors: As required by NFPA 80-2013.

.3 Clearances for Non-Fire-Rated Doors: Not more than 3 mm (1/8") at jambs and heads, except not more than 6 mm (1/4") between pairs of doors. Not more than 19 mm (3/4") at bottom.

.4 Drill and tap or reinforce for mortised or surface mounted hardware in accordance with accepted hardware schedule, ANSI A115, NFPA 80-2013, or manufacturers recommendations.

.5 Countersink exposed fasteners unless otherwise shown. Use flat or oval head screws.

.6 Reinforce components to resist stresses imposed by hardware in use.

.7 Allow for anticipated expansion and contraction of frames and supports.

.8 Fit elements at intersections and joints accurately together, in true planes, and plumb and level.

.9 Weld continuously at joints exposed to view or at joints through which air or water could penetrate from the exterior of building to the interior.

.10 Perform welding to CSA W59-18.

.11 Mortise, reinforce, drill and tap to receive hardware and security devices using templates provided by respective *Supplier*.

.12 Touch up finish damaged during fabrication.

.13 Prepare doors or frames to receive seals where seals are indicated.

.14 Attach labels to suit required fire-protection ratings.

2.5 Fabrication - Steel Doors and Panels

.1 Fabricate steel doors and panels to a thickness of 45 mm (1-3/4"), unless indicated otherwise.

.2 Interior and non-insulated doors and panels:

.1 Face sheets fabricated from 1.06 mm (0.042") (18 gauge) steel.

.2 Honeycomb core.

.3 Longitudinal edges mechanically interlocked.

.1 Adhesive assisted with edge seams visible

.3 Exterior and insulated doors and panels:

.1 Face sheets fabricated from 1.34 mm (0.053") (16 gauge) steel.

.2 Insulation core: Polyisocyanurate.

.3 Longitudinal edges mechanically interlocked.

.1 Adhesive assisted with edge seams visible

.4 Fabricate of composite metal face construction with each face formed from flush sheet steel without visible seams, free of scale, pitting, coil brakes, buckles and waves.

.5 Formed edges shall be true and straight with minimum radius for the thickness of steel used.

.6 Lock and hinge edges shall be bevelled 3 mm in 50 mm (1/8" in 2") unless hardware or door swing dictates otherwise.

.7 Top and bottom of doors shall be provided with inverted, recessed, 1.34 mm (0.053") (16 gauge) steel end channels, welded to each face sheet at 50 mm (2") on centre maximum.

.8 Prior to shipment, mark each door with an identification number as shown on the approved submittal drawings.

.9 Exterior doors shall be provided with factory installed flush PVC top caps. Fire labelled exterior doors shall be provided with factory installed flush steel top caps.

.10 Blank, reinforce, drill and tap doors for mortised, templated hardware. Locate hardware to manufacturer's standard unless indicated otherwise.

.11 Holes 12.7 mm (1/2") and larger shall be factory prepared.

.12 Glazing:

.1 For glazing materials up to and including 8 mm (5/16") thick, doors shall be provided with 0.81 mm (0.032") (20 gauge) steel glazing trim and snap-in glazing stops.

.2 For glazing materials greater than 8 mm (5/16") thick, doors shall receive 0.81 mm (0.032") (20 gauge) steel trim and screw fixed glazing stops. Screws shall be #6 x 32 mm (1-1/4") oval head Tek™ (self-drilling) type at 305 mm (12") on centre maximum.

.3 Acid etched glazing in accordance with Section 08 80 00.

.4 Glazing trim and stops shall be accurately fitted (within 0.39 mm (0.015") tolerance), butted at corners, with removable glazing stops located on the 'push' side of the door.

.13 Fabricate closing stiles of paired doors as indicated or scheduled.

.14 Where indicated in schedule, prepare doors and panels for installation of fire-rated door grilles. If required to meet door grille manufacturer's rated design, provide reinforcement around door grille opening.

2.6 Fabrication - Steel Frames

.1 General: Applicable to frames, transom panel frames, sidelights, and window assemblies.

.2 Exterior and thermally broken frames:

.1 Fabricated from:

.1 1.34 mm (0.053") (16 gauge) steel.

.2 1.70 mm (0.067") (14 gauge) steel for frames noted as heavy duty.

.2 Supplied set-up and welded (SUW).

.3 Interior and exterior sections of thermally broken frames, separated by continuous PVC thermal break.

.4 Thermally broken sections shall not be assembled by means of screws, grommets or other fasteners.

.5 Welds shall not cause thermal transfers between interior and exterior surfaces of the frame sections.

.6 Closed sections (mullions and center rails) factory insulated with fibreglass batts.

.7 Incorporate head drips of same gauge material as frame and plug weld at 150 mm (6") on centre, fill and sand smooth.

.3 Interior and non-thermally broken frames; welded:

.1 Fabricated from:

.1 1.34 mm (0.053") (16 gauge) steel.

.2 1.70 mm (0.067") (14 gauge) steel for frames noted as heavy duty.

.2 Supplied set-up and welded (SUW).

.4 Factory assembled frame product shall be square, free of defects, warps or buckles.

.5 Set-up and welded corner joints (SUW):

.1 Profile welded–punch mitred, continuously welded on inside of the profile faces, rabbets, returns and soffit intersections, with exposed faces filled and ground to a smooth, uniform seamless surface, as defined in the CSDMA - "Recommended Specifications for Commercial Steel Door and Frame Products".

.6 Set-up and welded joints at mullions, sills and center rails:

.1 Coped accurately, butted and tightly fitted.

.2 At intersecting flush profile faces, securely weld, fill and grind to flush, smooth, uniform, seamless surface.

.3 At intersecting recessed profile faces, securely weld to concealed reinforcements, with exposed hairline face seams.

.4 At other intersecting profile elements make exposed face seams to hairline tolerance.

.7 Where required due to site access, when required for co-ordination or installation, or shipping limitations, frame product shall be fabricated in sections for splicing in the field.

.1 Field spliced jambs, heads and sills shall be provided with 1.34 mm (0.053") (16 gauge) steel splice plates securely welded into one section, extending 100 mm (4") minimum each side of splice joint.

.2 Field splices at closed sections (mullions or center rails) shall be 1.34 mm (0.053") (16 gauge) steel splice angles securely welded to the abutting member. Face of splice angle shall extend 100 mm (4") minimum into closed sections when assembled.

.3 Field splice joints shall be welded, filled and ground to present a smooth uniform surface by the installation company responsible for installation after assembly.

.8 On factory assembled frame product, provide 2 temporary steel shipping bars welded to the base of the jambs or mullions to maintain alignment during shipping and handling. Remove shipping bars prior to anchoring of frames to floor.

.9 Each door opening shall be prepared for single stud door silencers. Silencers shall be shipped loose for installation by installer, after finish painting.

.1 Single interior doors: 3 at strike jamb.

.2 Pair of interior doors: 2 at header.

.3 Weather-stripped doors: None required.

.4 Sound, light, or smoke sealed doors: None required.

.5 Transom panels: 2 at each jamb.

.10 Prior to shipment, mark each frame with an identification number as shown on the approved submittal drawings.

.11 Provide mullions and transom bars of closed construction type. For fixed condition, attach members to frame with butt-welded joints. For removable condition, attach members with removable mullion anchors.

.12 Conceal fastenings unless otherwise indicated.

.13 Anchor frames to floor by 1.34 mm (0.053") (16 gauge) thick angle clips, welded to frame and provide with 2 holes for floor anchorage.

.14 Grind welded corners to a flat plane, fill with metallic paste filler and sand to uniform smooth finish.

.15 Protect strike and hinge reinforcements using guard boxes welded to frames at masonry construction.

.16 Reinforce head of frames wider than 1220 mm (48").

.17 Brace frame units to prevent distortion in shipment and protect finish.

2.7 Hardware Reinforcements and Preparations

.1 Door and frame product shall be blanked, reinforced, drilled and tapped at the factory for fully templated mortise hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.

.2 Door and frame products shall be factory blanked and reinforced only for mortised hardware that is not fully templated.

.3 Where surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware are required frame product shall be reinforced only, with drilling and tapping done by field installation.

.4 Templated holes 12.7 mm (1/2") diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by installation on site. Templated holes less than 12.7 mm (1/2") diameter shall be factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.

.5 Hinge reinforcements shall be 3.12 mm (0.123") (10 gauge) steel minimum, high frequency type shall be provided.

.6 Frames shall be prepared for 114 mm (4.5") standard weight hinges minimum unless otherwise indicated.

.7 Doors and frames in excess of 2450 mm (96") rabbet height shall be prepared for 114 mm (4.5") heavy weight 4.6 mm (0.180") hinges minimum.

.8 Lock, strike and flush bolt reinforcements shall be 1.34 mm (0.053") (16 gauge) steel minimum, with extruded tapped holes that provide equivalent number of threads as 2.36 mm (0.093") (12 gauge).

.9 Reinforcements for surface mounted hardware, concealed closers and holders and flush bolts shall be 1.06 mm (0.042") (18 gauge) steel minimum.

.10 Reinforcements are not required for surface applied hardware supplied with thru-bolts and spacers or sex-bolts.

.11 Provide hardware mortises on perimeter frame members to be grouted in masonry or concrete partitions with 0.66 mm (0.026") (22 gauge) steel grout guards.

.12 Electrified hardware:

.1 Where electrically or electronically operated hardware is specified on the schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and inter-connected with CSA approved 12.7 mm (1/2") diameter conduit and connectors.

.2 Refer to electrical documents for general electrical rough-in details. At door locations indicated in electrical documents as requiring rough-in only of electrical (ie. where no electrically or electronically operated hardware is specified in the hardware schedule), provide enclosures, boxes, and conduit to permit future installation of devices without removal of grout, demounting of frames, or installation of exposed conduits.

.3 Frames:

.1 Frames with electrified devices shall include electrical connection boxes sized to accommodate devices specified in Section 08 71 00. At time of frame manufacture, electrical connection boxes shall be supplied by Divisions 26, 27, and 28 for installation into frame by work of this section.

.2 Frame electrical connection boxes shall be positioned flush to edge of frame face return. Clearance shall be maintained to allow wall material to be consistently applied for length of frame member. Frame connection boxes shall be welded in place and positioned to allow necessary clearance for electrical trade to install conduit and connection components, with conduit layout in a manner that takes conduit up to ceiling in an uninterrupted configuration and to accommodate wire installation.

.4 Doors:

.1 Doors with electrified devices shall be manufactured to include wire raceway in door panel to accommodate electrified devices, such as electric hinge, power transfer units, electrified locks, electrified door closures and electrified exit devices. Construction of raceways shall provide a continuous conduit or channel between entry and exit points to accommodate wire installation after door manufacture.

.2 Doors with electrified locks may require extended space to accommodate plug-type connection components or wire collection space. Coordinate with work of Section 08 71 00 and obtain hardware templates for electrified hardware clearly indicated on reviewed shop drawings and prior to door manufacture.

2.8 Frame Anchorage

.1 Frame products shall be provided with anchorage appropriate to floor, wall and frame construction.

.2 Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb.

.3 Frame products for installation in new masonry walls shall be provided with steel adjustable wall anchors of the T-strap, stirrup or wire, 1.34 mm (0.053") (16 gauge) minimum or 3.96 mm (0.156") diameter wire. Straps shall be not less than 50 mm (2") x 254 mm (10") in size, corrugated and/or perforated.

.4 Frame products installed in steel stud and drywall partitions shall be provided with 0.81 mm (0.032") (20 gauge) steel snap-in or "Z" stud type anchors.

.5 Jambs of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept machine bolt anchors, 6.4 mm (1/4") diameter, located not more than 150 mm (6") from the top and bottom of each jamb. Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcing and directly opposite on the strike jamb. Each preparation shall be provided with 1.34 mm (0.053") (16 gauge) anchor bolt guides.

.6 Anchor bolts and expansion shell anchors for the above preparations shall be provided by the installation company.

.7 Where frame product is installed prior to construction of the adjacent wall, each jamb shall be provided with 1.34 mm (0.053") (16 gauge) steel floor anchors. Each anchor shall be provided with 2 holes for mounting to the floor and shall be securely welded to the inside of the jamb profile.

.8 On sidelights or windows exceeding 3 m (9'-10") in width, installed in stud partitions, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 2.36 mm (0.093") (12 gauge) steel formed channels, mounting angles and adjusting brackets, with mounting angles welded to the inside of frame head. Formed channels, adjusting brackets and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by contractor responsible for installation.

2.9 Sizes and Tolerances

.1 Widths of door openings shall be measured from inside of frame jamb rabbet with a tolerance of ± 1.6 mm (+0.063").

.2 Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame with a tolerance of ± 1.2 mm (± 0.047").

.3 Unless finishing hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a 3 mm (1/8") clearance at jambs and head. A clearance of 19 mm (3/4") between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be ± 1.2 mm (± 0.047").

.4 Manufacturing tolerances on formed frame profiles shall be ± 0.8 mm (± 0.031") for faces, door stop heights and jamb depths. Tolerances for throat openings and door rabbets shall be ± 1.6 mm (± 0.063") and ± 0.4 mm (± 0.016") respectively. Hardware cut-out dimensions shall be as per template dimensions, ±0.4 mm (+0.015").

2.10 Hardware Locations

.1 Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in paragraph 2.9 of this section.

.2 Top of upper hinge preparation for 114.3 mm (4.5") hinges shall be located 180 mm (7.5") down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 114.3 mm (4.5") hinges shall be located 310 mm (12.625") from finished floor as defined in paragraph 2.9 of this section. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts.

.3 Strike preparations for unit, integral, cylindrical and mortise locks and roller latches shall be centered 1033 mm (40-5/16") from finished floor. Strikes for deadlocks shall be centered at 1220 mm (48") from finished floor. Strikes for panic or fire exit hardware shall be located as per device manufacturer's templates.

.4 Push and/or pulls on doors shall be centered 1070 mm (42") from finished floor.

.5 Preparations not noted above shall be as per hardware manufacturer's templates.

.6 Hardware preparation tolerances shall comply with the ANSI A115 standards.

PART 3 - EXECUTION

3.1 Examination

.1 Provide necessary grounds, bracing and strapping for fitting and adequate for securing of the work.

.2 Cooperate with work of other sections to ensure fastenings set by others are provided and located, their work is installed to their specifications and that those responsible for back priming are notified in sufficient time for them to schedule work.

3.2 Installation - Steel Doors and Frames

.1 Set frame product plumb, square, aligned, without twist at correct elevation in accordance with NAAMM-HMMA 840-17.

.2 Frame product installation tolerances:

.1 Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be ±1.6 mm (±1/16").

.2 Squareness tolerance, measured through a line 90° from one jamb at the upper corner of the product, to the opposite jamb, shall be ±1.6 mm (±1/16").

.3 Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be ±1.6 mm (±1/16").

.4 Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be ±1.6 mm (±1/16").

.3 Fire labelled product shall be installed in accordance with NFPA 80-2013.

.4 Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install temporary wood spreaders at mid-point of frame rabbet height to maintain frame widths. Remove wood spreaders after product has been built-in.

.5 Provide vertical support at center of head for openings exceeding 1250 mm (48") in width.

.6 Secure anchorages and connections to adjacent construction.

.7 Execute installation and assembly using skilled forces under supervision of a competent joinery foreperson.

.8 Install doors in accordance with NAAMM-HMMA 840-17, maintaining clearances outlined in paragraph 2.10 of this section.

.9 Adjust operable parts for correct clearances and function.

.10 Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.

.11 Remove grout or other bonding material from products immediately following installation.

.12 Provide appropriate anchorage for floor and wall construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite the strike jamb. On each jamb, install 2 anchors for openings up to and including 1525 mm (60") high and install 1 anchor for each additional height of 760 mm (30") of height or fraction thereof, except as indicated below. Frames placed in previously placed concrete, masonry or structural steel shall be provided with anchors located not more than 150 mm (6") from top and bottom of each jamb, and intermediate anchors at 660 mm (26") on centre maximum.

.13 Secure frames set in previously constructed concrete or masonry openings by countersunk expansion bolts at same centres as for adjustable Tee wall anchors. Reinforce frame at fastening location to prevent indentation of frame by fastening device.

.14 Fill and grind smooth "punch and dimpled" frame installations.

.15 Prior to site touch-up, exposed surfaces of galvanneal steel to be finished shall be cleaned to remove foreign matter. Refer to paint manufacturers recommendations for additional information and requirements of Section 09 91 00.

.16 Touch-up exposed field welds shall be finished to present a smooth uniform surface and with a rust inhibitive primer.

.17 Touch-up exposed surfaces that have been scratched or otherwise marred during shipment, installation, and handling shall be with a rust inhibitive primer.

.18 Finish paint in accordance with Section 09 91 00.

.19 Install door silencers.

.20 Adequately fasten units and secure in place with concealed fixings wherever possible. Include grounds and furring where required.

.21 Make allowance for deflection to ensure structural loads are not transmitted to frames.

.22 Adjust operable parts for correct clearances and function.

3.3 Installation - Finishing Hardware

.1 Install finishing hardware in accordance with ANSI A115.1G-1994, manufacturers' templates and instructions, and Section 08 71 00.

3.4 Adjusting and Cleaning

.1 Adjust doors to swing freely, smoothly and easily, to remain stationary at any point, to close evenly and tightly against stops without binding, and to latch positively when doors are closed with moderate force.

.2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by *Supplier's* requirements.

.3 Ensure that doors equipped with closers operate to close doors firmly against anticipated wind and building air pressure, and to enable doors to be readily opened as suitable for function, location and traffic.

.4 Clean hardware after installation in accordance with *Supplier's* requirements.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Aluminum entrances and storefronts; CW1.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit engineered shop drawings.

.2 Further to requirements of Section 01 33 00, indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, field welding, coordination with hardware and electrical requirements.

.3 Identify and describe material types being supplied, wall thicknesses of extrusions, and shapes including connections and grades, dimensions and tolerances (minimum and maximum), attachments, reinforcing, anchorage and locations of fastenings, and provisions for thermal and structural movement between components of this section and adjacent materials.

.4 Include description of materials, metal finishing specifications, and other pertinent information.

.5 Design loads, typical reactions and support movement allowances, both vertical and horizontal, shall be placed on the shop drawings.

.6 Shop drawings shall clearly indicate the specification of materials and, where applicable, indicate installation methods and coordination with other sections.

.7 Submit framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

.4 Samples:

.1 Submit samples of frame, sill and mullion sections, sill flashing and accessories, fasteners for connection of frame to opening, glazing tape, glass retainers, glazing gaskets, screening and frame, spandrel panels and each finish material and any other material, as requested.

.2 Samples of colour and finish prepared as specified on respective metal components for both extrusion and sheet.

.3 Identify samples as to treatment, thickness, alloy, framing composition, colour, manufacture, performance standard and portion of the work to which they apply.

.4 Fabrication shall not proceed without written acceptance of samples from *Consultant*.

.5 Test reports:

.1 Submit valid laboratory test reports, prepared by an independent laboratory, verifying that proposed system has been tested by an independent laboratory and achieved performance values that meet the specified performance criteria.

1.4 Closeout Submittals

.1 Closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance instructions for incorporation into the operation and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Execute work of this section only by company who has adequate plant, equipment, and skilled workers to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.2 Provide at least one trade specialist who shall be thoroughly trained and experienced in skills required, be completely familiar with referenced standards and requirements of this work, and personally direct installation performed under this section.

.1 Foreperson experience: Minimum 10 years experience as glazing mechanic.

.2 Typical glazing mechanic experience: Minimum 3 years experience as glazers.

.3 Welding: Perform welding of structural components only by fabricators certified by Canadian Welding Bureau to CSA Welding qualification codes; CSA W47.1-19 for welding of steel, and CSA W47.2-11(R2020) for welding of aluminum.

1.6 Delivery, Storage, and Handling

.1 Store parts in a dry place and permit natural ventilation over their finished surfaces.

.2 Store materials in locations protected from damage of other trades.

.3 Under conditions of high humidity or cold temperatures, supply heating or forced air ventilation to prevent accumulation of surface moisture.

.4 Mark components to show location on building and on drawings.

.5 Protect finishes with strippable coating that will not mar, nor deface finish on removal, or a similar method designed to afford an equivalent amount of protection. Leave protected coating intact until damage risk is past or immediately prior to final cleaning.

.6 Stacking should be done to prevent bending pressure or abrasion of finished surfaces.

.7 Brace and protect frame units to prevent distortion and damage in shipment and handling.

.8 Provide methods for lifting or hoisting units into place without causing damage.

1.7 Field Conditions

.1 Comply with requirements of *Product* manufacturers.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.2 This section shall assume responsibility for warranties of glass and glazing included in the work of this section, in accordance with Section 08 80 00.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Air Leakage; except entrance doors: Air leakage through the work shall not exceed 0.3 L/s/m^2 (0.06 cfm/ft^2) of glazing area when tested in accordance with ASTM E283-04 at test pressure of 300 Pa (6.24 psf).

.2 Water Penetration (other than entrance doors): No water penetration shall occur when the work is tested in accordance with ASTM E331-00, amended to prohibit water from passing through interior glazing seals or frame joints, at a test pressure of 300 Pa (6.24 psf).

.3 Fabricate mullions to ensure under specified loads a maximum deflection of 1/175 of mullion span or 19 mm (3/4"), whichever is less.

.4 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with building code.

.5 Design and size components to withstand sway displacement as calculated in accordance with building code.

.6 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system,

.2 Movement between system and perimeter framing components,

.3 Dynamic loading and release of loads,

.4 Deflection of structural support framing,

.5 Shortening of building concrete structural columns,

.6 Creep of concrete structural members,

.7 Mid-span slab edge deflection.

.7 Maintain continuous air barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.8 Position thermal insulation to exterior of air barrier.

.9 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

2.2 Materials

.1 Aluminum extrusions: Aluminum Association alloy AA6063-T5 or T6 temper for framing.

.2 Sheet aluminum: aluminum sheet, 0.92 mm (0.04") minimum thickness.

.1 Aluminum alloy:

.1 AA3003-H14 Painting Quality.

.2 AA5005H14 Anodizing Quality.

.3 Concealed sheet metal air barriers: 1 mm (0.04") (22 gauge) Z275 galvanized steel sheet.

.4 Fasteners: aluminum or Type 304 stainless steel, finished to match adjacent material.

.5 Isolation coating: alkali resistant bituminous paint or epoxy solution.

.6 Glazing gaskets: fully resilient, shim type butyl glazing tape or EPDM glazing gasket.

.7 Glass and other glazing materials: Refer to Section 08 80 00.

.8 Silicone Sealant: One component, chemical curing; capable of water immersion without loss of properties: cured Shore A Durometer hardness of 15 to 25 to ASTM D2240-15(2021), colour as selected by *Consultant*, where exposed, to ASTM C920-14.

.9 Sheet metal work air barrier sealant: One component elastomeric chemical curing, to ASTM C920-14.

.10 Insulation at spandrels, closures and flashings: ASTM C612-14, Type IVB, non-combustible to CAN/ULC-S114-05

.1 Acceptable *Products*:

.1 Johns Manville 'MinWool Curtainwall'.

.2 Rockwool 'CurtainRock'.

.11 Insulation attachment:

.1 Galvanized stick-pins, welded to sheet metal backpans, located at maximum spacing of 300 mm (12") o/c and within 150 mm (6") from edge of insulation boards. Seal welds with 1 coat zinc-rich coating.

.12 Air barrier membrane:

.1 Self-Adhesive membrane: Composite preformed modified membrane system consisting of SBS modified asphalt for low temperature flexibility and polyethylene scrim reinforcing. Acceptable *Products*:

.1 Bakor 'Blueskin SA' Self-Adhesive Grade Air Barrier Membrane.

.2 Soprema 'Sopraseal Stick 1100'.

.3 W.R. Meadows 'Air Shield'.

.2 Primer: as recommended by manufacturer.

.3 Membrane Properties:

.1 Thickness: 1.0 mm (40 mils).

.2 Application temperature: minimum +5°C.

.3 Service temperature: -40°C to +70°C.

.4 Elongation: 200% minimum in accordance with ASTM D412-16-modified.

.5 Low temperature flexibility: to -30°C to CGSB 37-GP-56M-1985.

.6 Air leakage: 0.15 L/m^2.s under a pressure differential of 75 Pa (0.01 PSI) in accordance with ASTM E283-04.

.13 Sheet metal backpans and air barriers: 0.91 mm (0.036") (20 gauge) thickness, galvanized sheet steel to ASTM A653/A653M-11, Designation G90/Z275.

.1 Fasteners: Corrosion resistant, zinc plated, covered and sealed to sheet metal with silicone sealant.

2.3 Entrance Framing and Storefront

.1 Aluminum entrance framing: 63.5 mm x 190.5 mm (2-1/2" x 7-1/2") frames and 190.5 mm x 190.5 mm (7-1/2" x 7-1/2") jambs, thermally broken extruded aluminum assembly with flush sight lines, equal to Kawneer '1600 Wall System 1'.

.2 All section shall be designed for shear block joinery.

2.4 Entrance Doors

.1 Narrowstile type factory fabricated from purpose made extruded aluminum framing, thermally broken.

.2 Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.

.3 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.

.1 Glass: 6 mm (1/4") clear fully tempered safety glass.

.2 Use double glazed double sealed units at exterior doors as per Section 08 80 00.

.4 Door stiles shall be weathered with metal backed polypropylene pile weather-stripping. Provide weather-stripping sweeps at door bottoms.

2.5 Manual Door Hardware

.1 Door hardware; hinges, closers, thresholds, push/pulls, locks, exit hardware, and as indicated: supplied by Section 08 71 00 for installation by this section.

.2 Door jambs and head shall be weatherstripped with metal backed pile weather-stripping.

.3 Door sills shall be weatherstripped with door sweeps.

.4 Finish hardware to match door finish unless otherwise indicated.

.5 Threshold: continuous type, 100 mm (4") wide, extruded aluminum.

2.6 Aluminum Column Covers

.1 Fabricate as indicated on the drawings, with 3 mm (1/8") aluminum (from flattened stock).

2.7 Fabrication; Metal/Air Vapour Barriers

.1 Brake form barriers from sheet metal to permit assembly using self-tapping screws, and attachment using powder-activated or pneumatic fixings or other means of secure fastening.

.2 Make provision in barrier design to accommodate movement resulting from thermal change and from structural deflection.

.3 Form edges to 45° to permit peripheral and joint sealing.

.4 Cut, fit and form metal air/vapour barriers as required to accommodate conflicting framing connections, mechanical and electrical appurtenances and other obstructions.

2.8 Finishes

.1 Exposed aluminum surfaces: 70% Kynar 500 or Hylar 5000 fluoropolymer resin systems, ceramic pigments and other select inorganic pigments to AAMA 2605-20.

.1 Acceptable *Products*:

.1 PPG 'Duranar XL'.

.2 Sherwin-Williams 'Fluropon Classic'.

.2 Colour:

.1 Colour to match: #UC 128701 Birchmount Grey by PPG.

.2 Colour to later selection by *Consultant* from manufacturer's standard range. Colour shall be:

.1 Solid.

2.9 Fabrication

.1 Sills: extruded aluminum, finished to match window frames, 20 mm (3/4") minimum projection beyond wall surface. Provide preformed end caps wherever sill terminates. Butt joint sill and provide preformed splice connector and sealant to prevent water penetration. Locate splice connectors (joint covers) at center line of mullions when required. Trim and detail corners neatly.

.2 Make allowances for deflection of structure. Ensure that structural loads are not transmitted to aluminum work.

.3 Provide structural steel reinforcement for strength, stiffness and connections.

.4 Fit intersecting members to flush hairline weathertight joints and mechanically fasten together, except where indicated otherwise.

.5 Conceal fastenings from view. Exposed fastenings where indicated.

.6 Form cut-outs, recesses, mortising or milling for finishing hardware to templates supplied. Reinforce with aluminum or galvanized steel plates.

.7 Field apply isolation coating to aluminum in contact with dissimilar metals and/or cementitious materials.

.8 Fabricated assemblies shall make required clearances other assemblies and for deflection of structure.

PART 3 - EXECUTION

3.1 Installation

.1 Install work of this section plumb, square, level, free from warp, twist and superimposed loads.

.2 Secure work in required position. Do not restrict thermal movement.

.3 Install hardware in accordance with templates.

.4 Adjust operable parts for correct function.

.5 Isolate from cementitious materials.

3.2 Air Vapour Barrier Closures

.1 It is the responsibility of this Section to give complete cooperation in providing and maintaining the continuity of air/vapour seal to adjacent materials to which the windows and frames abut.

.2 Fit flexible seals, tapes, sealants and gaskets at locations required to achieve air/vapour/water resistant and weathertight junctions.

.3 Ensure continuity of seal at end joints between lengths of material by overlapping and cementing. Caulk junctions of system components to themselves and other work with sealant to maintain effective vapour, air and water barrier and fix in place with an aluminum flat to the air/vapour seal line at the adjacent material and to the glazing rebate.

.4 Where deflection of structure will cause dynamic joint movement between aluminum work and dissimilar materials, install flexible seals of sufficient width to allow formation of bellows to take up any torsional and shear stresses.

3.3 Glazing

.1 Glaze aluminum windows at exterior using insulating glazing units in accordance with Section 08 80 00. Glaze interior windows using 6 mm (1/4") clear float glass typically, tempered at entry sidelites unless otherwise indicated.

3.4 Sealants

.1 Seal between frame members, sills and adjacent construction as a part of the work of this section and in accordance with Section 07 92 00.

3.5 Hardware

.1 Install in accordance with manufacturer's installation requirements.

.2 Accurately locate and adjust hardware to meet manufacturer's requirements. Use special tools and jigs as recommended.

.3 Set, fit and adjust hardware according to manufacturer's directions, at heights later directed by *Consultant*. Hardware shall operate freely. Protect installed hardware from damage and paint spotting.

.4 Powered hardware:

.1 Power wiring will be supplied and installed by electrical work installer including conduit, boxes and other electrical appurtenances, including connections and terminations. Be responsible for ensuring that all wiring work is done in accordance with the *Suppliers* wiring diagrams and directions.

.2 Arrange for testing and commissioning of system by the distributor of the system. Submit a copy of reports to the *Consultant*.

3.6 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.2 Manufacturer's field review shall be in accordance with Section 01 45 00.

3.7 Adjusting and Cleaning

.1 Cleaning on completion of installation:

.1 Remove deposits which affect appearance or operation of units.

.2 Remove protective materials.

.3 Clean interior and exterior surfaces by washing with clear water; or with water, and soap or detergent; followed by a clear water rinse.

.4 Clean and restore stained metal surfaces in accordance with manufacturer's recommendations. Replace if cleaning is impossible.

.5 Final cleaning is specified in Section 01 78 00.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Supply and off-load to place in a clean, dry, and secure room at the *Place of the Work*, which has been designated for storage of all finish hardware specified including necessary fastening devices.

.2 Supply all finish hardware required and not supplied under other Sections.

.3 Check and verify hardware information on door and frame shop drawings, prior to fabrication.

.4 Packaging, labelling, provision of installation instructions, templates, fixings and similar items, and delivery to the *Work* site.

.5 Give assistance at the *Place of the Work* to organize hardware storeroom and supply qualified staff to correctly categorize, mark, and arrange each item in groups to enable efficient dispensing in specified hardware groups for each door to installation trades.

.6 Provide qualified staff at the *Place of the Work* promptly to assist installation trades subsequent to being requested and to ensure that hardware is being correctly installed.

.7 Upon completion of installation of hardware, hardware *Supplier* shall arrange and conduct, in company of *Consultant* and *Contractor*, inspections to verify that all hardware is installed and functioning satisfactorily, and where necessary shall recommend adjustments of such items as closer arms, valves, door holders and latch and locksets. Report comments in writing to *Consultant* and *Contractor*.

.8 Supply temporary locking cylinders and keys for construction purposes. Locks used for *Contractor* security shall be keyed as required to conform to building operations' security requirements.

1.2 Administrative Requirements

.1 Coordination:

.1 Coordinate work of this section to ensure information and material is promptly provided, to ensure orderly and expeditious progress of the *Work*, and to comply with schedule for completion.

.2 Within 3 weeks of *Contract* Award, submit confirmed orders to manufacturers/*Suppliers* to *Consultant*.

.3 Assist *Contractor* to organize hardware storeroom and supply qualified staff to correctly categorize, mark, and arrange each item in groups to enable efficient dispensing in specified hardware groups for each door to installation trades.

.4 Coordinate the work of this section to ensure supplied hardware can function as required and can be installed within the particular details of the door and frame assemblies. Hardware that cannot be installed or will not function as intended will be replaced at no cost to the *Owner*.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Schedules and samples:

.1 Prepare and submit for review, a finish hardware schedule with technical product data sheets for use in the *Work*. List type, selected manufacturer's name and number, location, mounting heights and finish of hardware, and complete cross reference to door schedule.

.2 The indication or omission of a hardware component on the hardware schedule does not remove the responsibility of this section to ensure that all hardware can be installed and will function as intended.

.3 Submit samples of complete line of hardware and finishes. Identify samples indicating hardware item numbers used in the Finish Hardware Schedule, manufacturer's numbers, names, types, finishes, sizes and indication of door location(s). Approved samples will be retained for comparisons and returned upon completion of the *Work*.

.4 Prepare and submit for review, a keying schedule recognizing *Owner* requirements which shall be determined after award of *Contract*.

.4 Templates:

.1 Submit for distribution, 3 copies of templates, template information, installation instructions and details necessary to enable preparation for, and installation of finish hardware in accordance with Door Hardware Institute recommended procedures. Submit templates arranged and marked coincident with specified hardware designations.

.2 Submit promptly when requested, the foregoing information in 3-ring plastic hard-covered binders suitably identified.

.3 In lieu of 1.3.4.1 arrange for the issue by each hardware manufacturer, the manufacturer's standard book of template drawings, at the option of door and frame manufacturers.

.5 Jigs:

.1 Submit template jigs for each component to be recessed to enable installation trades to prepare doors to preclude misalignment and improper fit.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Instruct the *Owner's* designated representative in proper care and preventative maintenance of hardware to assure longevity of operation.

.2 Submit maintenance data for cleaning and maintenance of finish hardware.

.3 Submit to building maintenance staff prior to date of *Substantial Performance of the Work*, two sets of wrenches for door closers, locksets and fire exit hardware.

1.5 Quality Assurance

.1 Qualifications: Provide work of this section, executed by competent *Supplier* with minimum 5 years experience in *Products*, systems and assemblies specified and with approval of *Product* manufacturers.

1.6 Delivery, Storage, and Handling

.1 Package each item of hardware individually, complete with trim and necessary fastenings, and accessories, including wrenches, keys, and other appurtenances required to ensure correct installation. Mark each item as to contents and appropriate use in specified groups.

.2 All items of hardware subject to handling when installed shall be submitted with an easily removable covering to protect against scratches, abrasions, coating with dissimilar finish materials on adjacent surfaces, and tarnishing.

1.7 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36. In addition provide:

.1 Warranty period with regard to the work of this section with regard to the closers is 5 years.

.2 Provide manufacturer's standard extended warranties.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Comply with codes and requirements of governing authorities, and as specified.

.2 Provide hardware items with characteristics to meet specified fire ratings, and conform to exit requirements of governing authorities.

2.2 Materials

.1 Finish hardware: in accordance with Finish Hardware Schedule.

PART 3 - EXECUTION

3.1 Examination

.1 Before furnishing any hardware, carefully check *Contract Documents*, verify door swings, door and frame materials and operating conditions, and assure that hardware will fit work to be attached.

.2 Check shop drawings and frame and door lists affecting hardware type and installation, and verify to correctness thereof, or advise of required revisions. Check that doors, frames and panels requiring additional support are reinforced.

.3 Point out special requirements to installer. Make final adjustment of hardware, in particular closer arms, valves and locksets, to work properly.

3.2 Installation

.1 Install in accordance with manufacturer's written installation requirements. Refer also to installation requirements indicated, and specified in other sections of specifications.

.2 Accurately locate and adjust hardware to meet manufacturer's written requirements. Use special tools and jigs as recommended.

.3 Locate door stops to contact doors 75 mm (3") from latch edge.

.4 Take delivery of finishing hardware and install, except hardware specified as part of work of another section. Check each item as received.

.5 Set, fit and adjust hardware according to manufacturer's directions, at heights later directed by *Consultant*. Hardware shall operate freely. Protect installed hardware from damage and paint spotting.

.6 Sound and weather seals:

.1 Install seals to continuously seal entire perimeter of doors. Secure in place with non-ferrous screws, in accurate alignment.

.2 Maintain integrity of seal at head of doors fitted with closers. Adapt seals as required to achieve specified performance.

.7 Pre-drill kickplates and doors prior to installation of kickplates. Apply with water-resistant adhesive and countersunk stainless steel screws.

.8 Set thresholds on two continuous beads of polyurethane caulking fastened with a minimum of 4 countersunk screws.

3.3 Electrified Hardware

.1 Install electronic components, security components such as magnetic locks, sentronic hold open devices door status switches, card readers, processors, transformers, and other electric devices.

.2 Power wiring will be supplied and installed by Electrical Divisions 26, 27, and 28 including conduit, boxes and other electrical appurtenances, including connections and terminations. Be responsible for ensuring that all wiring work is done in accordance with the *Suppliers* wiring diagrams and directions.

.3 Arrange for testing and commissioning of system by the distributor of the system. Submit a copy of reports to the *Consultant*.

3.4 Keying

.1 Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

.2 Submit Construction Master Keying (CMK) and Grand Master Keying (GMK) upon completion of the work of this section.

3.5 Field Quality Control

.1 Field tests and inspections:

.1 Inspect the installation of finish hardware on an agreed frequency.

.2 Advise in writing of work being performed that will prejudice the installation or correct operation of items of hardware.

.3 Ensure items have been installed complete with required trim and accessories, and fastenings are adequately secured and approved. Ensure closer arms, valves, holder devices, locksets and latchsets are correctly adjusted.

3.6 Adjusting and Cleaning

.1 Adjust doors to swing freely, smoothly and easily, to remain stationary at any point, to close evenly and tightly against stops without binding, and to latch positively when doors are closed with moderate force.

.2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by *Supplier's* requirements.

.3 Ensure that doors equipped with closers operate to close doors firmly against anticipated wind and building air pressure, and to enable doors to be readily opened as suitable for function, location and traffic.

.4 Clean hardware after installation in accordance with *Supplier's* requirements.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Glass and glazing.

1.2 Administrative Requirements

.1 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Show details of each type of glazing system in conjunction with the framing system indicating type of glass, sizes, shapes, glazing material and quantity. Show details indicating glazing material, glazing thickness, bite on the glass and glass edge clearance.

.2 Indicate analysis of glass including maximum deflection and allowable stresses from imposed dead/live loads and thermal loads.

.4 Samples:

.1 Submit 305 mm (12") square samples of each type of glass indicated except for clear monolithic glass products, and 305 mm (12") long samples of each color required, except black, for each type of sealant or gasket exposed to view.

.1 Submit 3 control samples for each glass type showing maximum range of visible difference between units for the *Project*.

.2 Submit samples of glass showing each type of shape and finish of glass edge for exposed glass edges.

.5 Test and evaluation reports:

.1 Obtain compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealant as well as other glazing materials including insulating units.

.6 Manufacturer reports:

.1 Submit glass fabricator's product information and structural calculations indicating compliance with glazing standards established by the Glass Association of North America (GANA). Submittal to include thermal stress and structural load analysis of the proposed glass types, configuration and sizes.

.7 Submit sample glazing warranty.

.8 Submit letter from insulating glass unit fabricator that insulating glass units supplied will bear the certification mark of IGMAC or IGCC/IGMA.CAN/CGSB 12.8-97

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit maintenance and cleaning instructions for glass and glazing for incorporation into the operating and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Manufacturers: Fabrication processes, including low emissivity, insulating, laminated, and tempering shall be manufactured by a single manufacturer with a minimum of ten (10) years of fabrication experience and meet ANSI / ASQC 9002 1994.

.2 Installers / applicators / erectors: Provide the work of this section executed by specialist *Subcontractor* who shall be thoroughly trained and experienced in skills required, be completely familiar with referenced standards and requirements of the work of this section, and personally direct installation performed under this section.

.1 Foreperson experience: Minimum 10 years experience as glazing mechanic.

.2 Glazing mechanic experience: Minimum 3 years experience as glazers.

1.6 Delivery, Storage, and Handling

.1 Protect glass from edge damage, dust, and contaminants during handling and storage. For insulating units exposed to substantial altitude changes, comply with insulating glass manufacturers written recommendations for venting and sealing to avoid hermetic seal ruptures.

.2 Storage and protection: Protect glazing materials according to manufacturer's written requirements and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun or other causes.

1.7 Field Conditions

.1 Ambient Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by the glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation or other causes.

.2 Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 4.4°C.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.2 The glazing systems shall perform properly to the extent that the design and *Contract Documents* permit such performance for the duration of the warranty period.

.3 Special product warranty for laminated glass products:

.1 Provide written 5 year warranty from date of manufacture for laminated glass. Warranty shall cover deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to the glass manufacturer's published instructions. Warranty shall be manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units.

.4 Special product warranty for tempered glass products:

.1 Provide a written 5 year warranty from date of manufacture for fully tempered glass. Warrant that tempered glass will not break spontaneously as a result of Nickel Sulfide (NiS) inclusions at a rate exceeding 0.8% (8/1000) for a period of five years from the date of manufacture. Warranty shall be manufacturer's standard form in which tempered-glass manufacturer agrees to replace tempered-glass units.

.5 Special product warranty for insulating glass unit products:

.1 Provide a written warranty from date of manufacture for sealed insulating glass units. Warranty shall cover the following:

.1 Deterioration due to normal conditions of use and not to handling, installing, protecting and maintaining practices contrary to the glass manufacturer's published instructions.

.2 Replacement of sealed insulating glass units.

.3 No dollar limit.

.4 Non-prorated.

.5 10-year warranty duration.

.6 Special product warranty for spandrel glass products:

.1 Provide a written warranty from date of manufacture of spandrel glass product. Warranty shall cover the following:

.1 Deterioration due to normal conditions of use and not to handling, installing, protecting and maintaining practices contrary to the glass manufacturer's published instructions.

.2 Spandrel glass coating will not flake, peel, chip, blister, or develop any colour change.

.3 Replacement of spandrel glass units.

.4 10-year warranty duration.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 General:

.1 Publications: Comply with recommendations in the publications below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section.

.1 GANA Glazing Manual.

.2 GANA Engineering Standards Manual.

.3 GANA Laminated Glazing Reference Manual.

.4 GANA Sealant Manual.

.2 Glass strength:

.1 Design glass in conformance with the building code and the following requirements:

.1 Minimum thickness of annealed or heat-treated glass products to be selected so the worst case probability of failure does not exceed the following:

.1 8 breaks per 1000 for glass installed vertically less than 15 degrees from the vertical plane and under wind action.

.2 Maximum lateral deflection; insulating glass units:

.1 For insulating glass units supported on four edges, limit centre-of-glass deflection at design wind pressure to not more than 1/175 times the long-side length or 19 mm (3/4") maximum.

.2 Glass at guards, balustrades, and where glass is likely to be subjected to human impact shall comply with safety glass requirements of CAN/CGSB 12.20-M89 and CAN/CGSB 12.1-M90, DIN EN 14179-1:2005, where applicable, and building code.

.3 Provide annealed, heat strengthened, and tempered lights where required by the building code, and where required for the various solar exposures on the building.

.4 Glass thicknesses and glass types specified, indicated, or scheduled in the *Contract Documents* are minimums required. Glass designer/engineer to modify as required to satisfy design and building code requirements, and requirements of authorities having jurisdiction, and any such modifications shall be clearly indicated on shop drawings.

.3 Thermal and optical performance: Provide glass products with performance properties specified or published by glass manufacturer where not specified. Performance properties to be manufacturer's published data as determined according to the following procedures:

.1 Centre of glass U-Value: National Fenestration Rating Council (NFRC) 100 methodology using LBNL WINDOW 5.2 computer program.

.2 Centre of glass solar heat gain coefficient: NFRC 200 methodology using LBNL-35298 WINDOW 5.2 computer program.

.3 Visible light transmittance: NFRC 200 methodology.

.4 Solar optical properties: NFRC 300 or LBNL Optics.

.4 Glazing systems shall be capable of withstanding normal thermal movements, without failure, including loss due to defective manufacture, fabrication and installation; deterioration of glazing materials; and other defects in construction.

.5 Provide glass *Products* of uniform appearance, reflectivity, hue, shade, visible light transmittance, and colour when viewed from distance of 3 m (10 ft) to 30 m (100 ft) perpendicular to the glass or from 45 degree angle to the glass.

.6 Protect laminated glass interlayer from damage or discolouration resulting from contact with deleterious and incompatible sealants, substances, and materials. Comply with manufacturer's recommended installation requirements.

2.2 Glass Manufacturers

.1 Subject to compliance with the requirements of the *Contract Documents*, provide primary glass by one of the following float glass manufacturers:

.1 Cardinal Glass Industries.

.2 Guardian Industries, LLC.

.3 Pilkington North America.

.4 Vitro Architectural Glass.

2.3 Glass Materials

.1 General:

.1 Single source responsibility: Provide materials from a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source and manufacturing plant for each type and class required.

.2 Insulating glass units:

.1 Warm edge, hermetically sealed, CAN/CGSB 12.8-97 or ASTM E2190-10, minimum 12 mm (1/2") cavity, 90% argon/10% air filled, double sealed edges (primary to be polyisobutylene, secondary to be polysulphide,), desiccant filled warm edge spacer (splice connectors at corner of each glass unit).

.1 Warm edge spacer:

.1 Stainless steel: RPM Rollforming 'ST-2000', Allmetal 'SST', Fenzi 'Rolltech Stainless Steel'.

.2 Grey coloured polyisobutylene shall not be acceptable.

.3 Edge delete low 'E' coating down to bare glass in accordance with manufacturer's written requirements. Deletion shall be continuous around the entire periphery of glass edges to minimum deletion width from edge of glass to at least 50% through the primary sealant bead width.

.4 Set spacer bare evenly into glass units to maximum variation of +/- 2.0 mm (0.080")/length of spacer bar. Primary sealant shall not extend past spacer bar greater than 1.5 mm (0.060").

.5 IGMAC or IGCC/IGMA certified, permanently marked either on spacers or on at least one component lite of units with appropriate certification label.

.6 Low 'E' coating:

.1 Basis of design:

.1 Vertical glazing: not less than 0.76 mm (0.030") unless otherwise indicated.

.5 Interlayer colour: Clear unless otherwise indicated.

.6 Glass type: annealed or heat strengthened or tempered, as required to suit design requirements.

.7 Laminated glass products to be fabricated free of foreign substances and air or glass pockets in autoclave with heat plus pressure.

.6 Silicone-coated spandrel glass:

.1 Glass treatment: Tempered float glass.

.2 Thickness: 6 mm (1/4") minimum thickness.

.3 Coating Location: Second surface.

.4 Fallout Resistance: Passes fallout-resistance test in ASTM C1048-18 for an assembly of glass and adhered reinforcing material.

.5 One component, water-based silicone coating supplied as flowable, thixotropic emulsion.

.1 Colour: Custom colour to later selection by the *Consultant.*

.6 Acceptable silicone spandrel coating *Product*:

.1 Industrial Control Development Inc 'Opaci-Coat-300'.

.7 Satin etched glass:

.1 Satin acid etch (treated by liquid acids) on No. 3 surface to match *Consultant's* sample, by Walker Glass or equivalent. Etching to be approved by *Consultant.*

2.4 Glazing Materials

.1 Glazing materials; general: Select glazing sealants, tapes, gaskets and additional glazing materials of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

.2 Glazing gaskets: Moulded or extruded gaskets of profile and hardness required to maintain watertight seal, made from the following:

.1 Preformed silicone to ASTM C1115-17.

.3 Setting blocks: Moulded or extruded material with Shore, Type A Durometer hardness of 85, plus or minus 5, made from the following:

.1 Preformed silicone to ASTM C1115-17.

.4 Spacers: Moulded or extruded blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated made from the following:

.1 Preformed silicone to ASTM C1115-17.

.5 Edge blocks: Moulded or extruded material of hardness needed to limit glass lateral movement (side walking) made from the following:

.1 Preformed silicone to ASTM C1115-17.

3.2 Preparation

.1 Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

.2 Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

.3 Clean contact surfaces with solvent and apply primers to surfaces to receive tapes and sealants in accordance with the manufacturer's requirements. Ensure surfaces are free of moisture and frost.

3.3 Glazing - General

.1 Comply with combined written requirements of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

.2 Adjust glazing channel dimensions as required by conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

.3 Protect glass edges from damage during handling and installation. Remove damaged glass from *Project* site and legally dispose of off *Project* site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

.4 Clean glazing rebate surfaces of traces of dirt, dust, or other contaminants.

.5 Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

.6 Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

.7 Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

.8 Provide spacers for glass lites where length plus width is greater than 1270 mm (50").

.1 Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

.2 Provide 3.2 mm (1/8") minimum bite of spacers on glass and use thickness equal to sealant width.

.9 Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel.

.10 Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

.11 Set glass lites with proper orientation so that coatings face exterior or interior as specified.

.12 Glaze hollow metal doors and frames specified under work of Section 08 11 13 using tape glazing installation.

3.7 Acid Etched Glass Protection

.1 Clean and prepare glazing surfaces to manufacturer's requirements.

.2 Shop-apply glass sealer protection in a clean dust free environment; sealer application in accordance with sealer manufacturer's written requirements.

3.8 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

3.9 Adjusting and Cleaning

.1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

.2 Final cleaning of glass in accordance with Section 01 78 00.

END OF SECTION

.1 Steel screws shall be equal to or exceed minimum diameter indicated on shop drawings.

.2 Penetration beyond joined materials shall be not less than 3 exposed threads.

.3 Thread types and drilling capability shall conform to manufacturer's recommendations.

2.3 Partition Support Materials

.1 Interior non-loadbearing channel stud framing: to ASTM C645-18; roll formed from 0.455 mm (0.0179") minimum thickness unless otherwise indicated or as recommended by gypsum board manufacturer, galvanized steel sheet. Provide service holes starting at 450 mm (18") from bottom, then 914 mm (36") on centre to top of studs.

.1 Steel studs; at backer plate locations: 0.836 mm (0.0329") minimum thickness.

.2 Interior floor and ceiling tracks (runners): to ASTM C645-18; in widths to suit stud sizes.

.1 Metal thickness: to match studs.

.2 For openings wider than 914 mm (36"), provide 0.836 mm (0.0329") minimum thickness for header.

.3 Interior floor and ceiling track (runner) fasteners:

.1 To concrete and masonry: Use stub nails or power-driven fasteners.

.1 Power actuated fastening systems are not permitted.

.2 To suspended acoustic ceiling tile grid: Manufactured to fit applicable ceiling grid profile; CGC 'Partition Clip'.

.4 Bracing channels: Minimum 19 mm x 10 mm x 1.087 mm (3/4" x 3/8" x 0.0428") cold rolled galvanized steel.

2.4 Ceiling Support Materials and Systems

.1 General: Size ceiling support components to comply with ASTM C754-20 unless otherwise indicated.

.2 Main runners: Steel channels, hot or cold rolled; Z180 (G60) galvanized.

.3 Hanger wire: ASTM A641/A641M-09A(2014), soft, Class 1 galvanized, minimum 4.064 mm (0.160", 8 AWG).

.4 Hanger rods and flats: Mild steel with zinc coating, galvanized for exterior applications.

.1 General: Size devices for 5 times load imposed by completed system as determined in accordance with ASTM E488/E488M-18.

.2 Screws, clips, bolts, concrete inserts or other devices for ceiling hangers whose suitability for use intended has been proven through standard construction practices or by certified test data.

.3 Hangers: Comply with ASTM C754-20 for maximum ceiling area and loads to be supported.

.4 Interior concrete ceiling anchors:

.1 Acceptable *Products*:

.4 Elimination of backer plates or direct attachment of accessories or equipment to studs will not be permitted.

PART 3 - EXECUTION

3.1 Installation General

.1 Comply with ASTM C754-20 and manufacturer's requirements, except as modified herein. Do not bridge building expansion joints with support system. Frame both sides of joints with furring and other supports as indicated.

.2 Provide and install studs, framing, shimming, and furring to provide proper support for gypsum board to achieve the following installation tolerances:

.1 Do not exceed 3 mm (1/8") in 3 m (10') variation from plumb, level, and plane.

.2 Do not exceed 10 mm (3/8") from drawings locations.

.3 Do not exceed 1.5 mm (1/16") variation between planes of abutting edges or ends.

.4 Install each framing member so fastening surfaces vary not more than 3.2 mm (1/8") from the plane formed by faces of adjacent framing.

.5 In double stud walls, do not bridge across studs on opposite sides of wall with gypsum board or metal cross bracing.

.3 Give complete cooperation and direction to trades erecting framing and furring over which this work is applied. Coordinate finished joint location with framing.

.4 Coordinate installation and cooperate with mechanical and electrical work to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with the partitions, ceiling and soffit systems.

.1 Where the presence of suspended ductwork or other mechanical or electrical services or devices above ceiling framing conflicts with ceiling framing suspension points from structure above, provide bridging framing below conflicting work as required to support ceiling framing on specified intervals.

.2 Do not suspend ceiling framing from mechanical or electrical suspension systems unless agreement is obtained in writing from engineer for *Subcontractor* installing such framing that additional imposed loads are acceptable; obtain *Consultant's* acceptance before proceeding.

.5 Provide clearances between work of this section and structural elements to prevent transference of structural loads.

.6 Do not bridge building expansion joints with steel framing or furring members. Independently frame both sides of joints with framing of furring members or as indicated.

.7 Size framing systems according to manufacturer's engineered load tables, to meet allowable deflection without permanent deformation.

.1 Maximum allowable deflection: L/240.

.2 Maximum allowable deflection for tiled partitions: L/360.

.2 Frame openings and around built-in equipment, cabinets, access panels, on 4 sides, with channels. Extend furring into reveals. Check clearances with equipment suppliers.

.3 Provide bulkheads and boxed-in duct shafts, for beams, columns, pipes and around exposed services where indicated. Install 19 mm (3/4") channels at corners and at 305 mm (12") on centre.

3.6 Metal Stud Partition Framing

.1 Provide partition tracks (runners) at floor and underside of structural assembly and as follows:

.1 Align accurately and lay out according to partition layout.

.2 Secure runners to concrete, access flooring and to concrete slabs, as applicable, with screwed or shot fasteners located 50 mm (2") from each end and spaced at maximum 610 mm (24") on centre.

.3 At partition corners, extend one runner to end of corner and butt other runner to it, allowing necessary clearance for gypsum board thickness. Runners should not be mitred.

.2 Unless otherwise indicated, place interior studs vertically at centres as follows:

.1 Provide studs at 400 mm (16") on centre, and as specially spaced in accordance with details indicated.

.2 Provide studs not more than 50 mm (2") from abutting walls, openings and each side of corners.

.3 Provide freedom for 19 mm (3/4") deflection under beams, structural slabs and the like to avoid transmission of structural loads to studs, or install 50 mm (2") leg ceiling tracks.

.3 Install studs in tracks at floor and ceiling.

.4 Where horizontal runs of service lines are scheduled to be installed, arrange with applicable trades and install studs simultaneously with services.

.5 At openings in stud walls, erect track at head and sills to accommodate intermediate studs. At each end of track, cut out flanges, turn up web, and fasten to studs. Install intermediate studs above and below openings in same manner and spacing as wall studs. Install double studs at each jamb, and double tracks at head of door openings.

.6 At partitions requiring fire rating, erect in accordance with requirements of listing.

.7 Size studs, connections, and runners to carry loads according to stud manufacturer's load tables, at 24 kg/m^2 (5 lb/ft^2) live load to meet maximum allowable deflection limits. Where depth of stud is indicated, size metal thickness to meet allowable deflection limits.

.8 Provide three studs at corner and intermediate intersections of partitions.

.9 Coordinate work with others installing horizontal runs of service lines so that work is done simultaneously. Where standard holes are too small for installed services, notch studs, and splice notched flanges with splice pieces 305 mm (12") longer than notches, each fastened with 2 screws.

.10 Coordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Plain gypsum board.

.2 Fire-rated gypsum board.

.3 Glass scrim tile backer board:

.4 Exterior fibre reinforced gypsum sheathing (exterior sheathing board); glass scrim gypsum sheathing board.

.5 Gypsum board accessories and miscellaneous related materials.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Fire-rated assembly listings and STC assembly ratings:

.1 Submit fire-rated assembly listings for each required fire resistance rated assembly for work of this section.

.2 Submit STC assembly ratings for each required STC rated assembly for work of this section.

1.3 Quality Assurance

.1 Qualifications:

.1 *Subcontractor* executing the work of this section shall have a minimum of 10 years continuous experience in successful installation of work of type and quality indicated and specified.

1.4 Delivery, Storage, and Handling

.1 Store materials in protected dry areas. Store gypsum board flat in piles with edges protected.

.2 Ensure that finish metal members are not bent, dented, or otherwise deformed.

.3 Deliver *Products* supplied under the work of this section only to those who are responsible for installation, to the place they direct, and to meet installation schedules.

.4 Package fire rated materials with labels attached.

1.5 Field Conditions

.1 Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum boards.

.1 Paper faced gypsum core panel with a specially formulated core for use in fire-resistive Type X or Type C designs, to ASTM C1396/C1396M-14.

.2 Acceptable *Products*:

.1 CertainTeed 'Type X and Type C'.

.2 CGC 'SHEETROCK Brand Firecode X and Firecode C'.

.3 Georgia-Pacific 'ToughRock Fireguard X Gypsum Board and ToughRock Fireguard C Gypsum Board'.

.4 Continental Building Products 'Type C and Type X.

.5 National Gypsum 'Gold Bond Brand Fire-Shield Gypsum Board and Gold Bond Fire Shield C Gypsum Board'.

.6 PABCO Gypsum 'QuietRock ES'.

.3 Glass scrim tile backer board:

.1 Glass scrim fibre faced water resistant gypsum board with moisture resistant core and fibreglass face mats and heat cured water resistant face coating to ASTM C1178/C1178M-13. 16 mm (5/8") thick unless otherwise indicated.

.2 Type X to ASTM C1658/C1658M-13 where required at fire rated assemblies.

.3 Acceptable *Products*:

.1 CertainTeed 'GlasRoc Diamondback Tile Backer'.

.2 CGC 'Durock Brand Glass-Mat Tile Backerboard'.

.3 Georgia-Pacific 'Dens-Shield Tile Backer'.

.4 Exterior fibre reinforced sheathing board:

.1 Service grade: Exterior grade.

.2 Fibreglass mat faced on front and back sides and long edges, silicone-treated water-resistant core, to ASTM C1396/C1396M-14ASTM C1177/C1177M-13, fire rated where indicated.

.1 Acceptable *Products*:

.1 CertainTeed 'GlasRoc Sheathing'.

.2 CGC 'Securock Glass-Mat Sheathing'.

.3 Georgia-Pacific 'Dens-Glass Sheathing'.

2.4 Attachment Materials

.1 Screws; for gypsum board: bugle head, fine thread, self-tapping, Type W or S or S-12 point to suit framing type and metal gauge, with corrosion resistant finish to ASTM C1002-07/ASTM C954-11. Screw sizing:

.1 #6 x 25 mm (1") for single thickness board fastening.

.2 #6 x 32 mm (1-1/4") for single thickness 15.9 mm (5/8") board fastening.

.3 #7 x 41 mm (1 5/8") for double thickness board fastening.

.3 Fill and finish coats: Use sanding type setting-type or taping compound as recommended by panel board manufacturer.

.4 Joint compound for exterior applications:

.1 Glass-mat gypsum sheathing board: As recommended by sheathing board manufacturer.

.5 Joint compound for tile backing panels:

.1 Tile backer board; coated glass scrim gypsum board: As recommended by backing panel manufacturer.

2.8 Acoustic Wall Assembly Materials

.1 Acoustic sealant; concealed locations: to meet material requirements as listed in Part 9 of ASTM C919-12(2017), including ASTM C834-10 or ASTM C920-14:

.1 Acceptable *Products*:

.1 Hilti Canada Corp 'CS-S SA Light'.

.2 Owens Corning 'QuietZone Acoustic Sealant'.

.3 Pecora 'AC20'.

.4 Tremco 'Tremflex 834'.

.5 Substitutions: in accordance with Section 01 25 00.

.2 Acoustic sealant; exposed locations, acrylic:

.1 Acrylic/latex acoustic sealant, Type S, Grade NS, Class 12.5 to ASTM C920-14, maximum VOC content 60 g/L, non-hardening or ASTM C834-10, Type OP, Grade -18° C.

.2 For exposed sealants use paintable sealant products, do use non-skinning type products where they are exposed to view or where sealant products may deteriorate (stain or bleed into) into painted surfaces.

.3 Acceptable *Products*:

.1 Hilti Canada Corp 'CS-S SA Light''.

.2 Master Builders Solutions Canada 'MasterSeal NP 520'.

.3 Owens Corning 'QuietZone Acoustic Sealant'.

.4 Pecora 'AC20'.

.5 Tremco 'Tremflex 834'.

.3 Smoke and acoustic sealant; concealed locations, non-fire-rated acoustic assemblies:

.1 Acrylic smoke and acoustic sealant, to ASTM C834-10 maximum VOC content 60 g/L, paintable, Flame Spread Value of maximum 25 to CAN/ULC S102.

.2 Sealant shall not deteriorate (stain or bleed into) painted surfaces.

.3 Acceptable *Products*:

.1 Hilti Canada Corp 'CP 506'.

.2 Substitutions: in accordance with Section 01 25 00.

.1 Do not exceed 3 mm (1/8") in 3 m (10') variation from plumb, level, and plane in exposed surfaces, except at end joint between gypsum board panels.

.2 Do not exceed 10 mm (3/8") from indicated location.

.3 Do not exceed 1.5 mm (1/16") variation between planes of abutting edges or ends.

.4 Surface flatness shall not exceed 1.5 mm (1/16") within 305 mm (12") straight edge. For non-tapered-edge end joints between boards, measure flatness tolerance with end of straight end at centreline of joint.

3.2 Accessories

.1 At external corners install corner trim secured to framing at 230 mm (9-1/16") on centre on both flanges with screw fasteners or clinch tool.

.2 Secure casing trim at board edges where exposed to view, where board butts against other materials with no trim to conceal junction, at perimeter of ceiling surfaces at tops of partitions where they stop against continuous ceiling surfaces, and where indicated.

.3 Erect accessories straight, plumb or level, rigid and at proper plane.

.4 Use full length pieces.

.5 Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners, free from rough edges. Secure in accordance with manufacturer's specifications unless otherwise required.

.6 Installation tolerances:

.1 Alignment with board panels shall not exceed tolerances specified above.

.2 End joints shall be flush aligned to maximum offset of 0.5 mm (0.020").

3.3 Board Application - General

.1 Before application of gypsum board commences, ensure that internal services have been installed, tested, and approved; that conduits, pipes, cables, and outlets are plugged, capped, or covered; and that fastenings and supports installed by others are in place.

.2 Extend board into door, window, and other openings, reveals, behind fitments, and other applied items and on metal stud partitions to structure above unless indicated otherwise.

.3 Apply board with long dimension perpendicular to supports, unless otherwise indicated.

.4 Locate joints on opposite sides of partitions on different studs, and at least 305 mm (12") from opening jambs.

.5 Install board to minimize joints, and align end joints to be the least objectionable (where they are unavoidable), according to the indicated lighting design. Locate joints in ceilings where least prominently discerned, and never line them up with opening edges.

.6 Form smooth joints at ends and at field cut edges of board panels.

.7 Fasten board to metal support members by metal gypsum board screws, 9.5 mm (0.374") minimum to, and 12.7 mm (1/2") maximum from, center of joints. Space screws:

.1 At fire rated board as per fire-rated assembly.

.2 At typical board walls at 400 mm (16") on centre at edges and field unless otherwise required.

3.6 Acoustic Wall Assemblies

.1 Acoustical sealant and plaster:

.1 Apply acoustical sealant to seal gaps in accordance with ASTM C919-12(2017) and in accordance with the STC rated assembly.

.2 Apply single bead or double, one for each base and face layer of gypsum board as applicable to STC rated assembly, of acoustic sealant to seal both sides of partition assembly between gypsum board and adjacent floor, wall, and ceiling assembly of partitions which contain sound attenuation insulation, and where noted.

.3 Apply bead of acoustic sealant to seal both sides of partition assembly at top and bottom of control joints.

.4 Apply bead of acoustic sealant to seal intersections with sound-isolating partitions that are extended to reduce sound flanking paths.

.5 Apply bead of acoustic sealant to seal joint between penetrations and gypsum board.

.6 Completely seal objects at wall and gypsum board penetrations (such as electrical boxes, piping, and fasteners) with heavy coating of premixed perlite plaster.

.7 Apply sealant to clean, dry surfaces.

.8 Apply sealant to close voids; no leaks around track and gypsum board.

.2 Sound attenuation insulation:

.1 Install sound attenuation insulation to fill cavity unless otherwise indicated.

.2 Trim insulation to provide close-fit contact to framing assemblies and fill the partition cavity or acoustic insulation assemblies to thicknesses specified or indicated.

.3 Maintain air space between backs of sound attenuation insulation and back of opposite partition face layer, as applicable.

.4 Cut insulation to provide close-fit contact around electrical boxes, pipes, and other obstructions and penetrations through and within acoustic assemblies.

.5 Extend acoustic partition assemblies to underside of structure. Incorporate approved provision to prevent transmittance of structural deflection to partition assembly.

.6 Staple sound attenuation insulation where required by manufacturer's installation requirements.

.7 Where studs are not faced with gypsum board on both sides, mechanically fasten wire mesh to non-faced side of stud to retain insulation.

.8 Mechanically attach sound attenuation insulation in wall assemblies where cavity of wall assembly is greater than 150 mm (6").

.9 Secure insulation in such a manner that it will not sag or settle away from required locations.

.3 Sound flanking paths:

.1 Fastener heads and accessories shall be covered with total of 2 separate coats of joint compound.

.5 Third coat (Level 4):

.1 After second coat has dried, sand surface lightly and apply thin finish coat to joints, fasteners and trim, feathering compound 50 mm (2") beyond edge of second coat.

.2 Allow third coat to dry. Apply additional compound, and touch-up and sand, to provide surface free of visual defects, tool marks, and ridges, and ready for application of finish.

.3 Finished joints will be accepted with a camber not greater than 1 mm (1/32") and shall be seamless, plumb, true and flush and with square, neat corners.

.4 Fastener heads and accessories shall be covered with total of 3 separate coats of joint compound.

.3 Joint compound:

.1 Apply finish coat of compound feathering 75 to 100 mm (3" to 4") beyond tape edges.

.2 Feather coats onto adjoining surfaces so that camber is maximum 0.79 mm (1/32").

.4 Trim:

.1 Use same fasteners to anchor trim accessory flanges as required to fasten gypsum board to supports, unless otherwise recommended by trim manufacturer.

.2 Install metal corner beads at external corners.

.3 Install metal casing bead trim whenever edge of gypsum base would otherwise be exposed or semi exposed, and where gypsum base terminates against dissimilar material.

.4 Erect beads plumb or level, with minimum joints.

.5 Control joints:

.1 Provide control joints set in board facing. Support control joints with studs or furring channels on both sides of joint.

.2 Provide control joints in required locations.

.1 Review control joint locations with *Consultant* prior to installation.

.3 Install control joints where a partition, wall, or ceiling traverses a construction joint (expansion, seismic or building control element) in the building structure.

.4 Install control joints where a wall or partition runs in an uninterrupted straight plane exceeding 9100 mm (30 linear feet).

.5 Install control joints in interior ceilings:

.1 With perimeter relief:

.1 Linear dimensions between control joints shall not exceed 15000 mm (50 ft) and total area between control joints shall not exceed 230 m² (2500 ft²).

3.10 Adjusting and Cleaning

.1 Clean up and remove surplus materials and rubbish resulting from the work of this section upon completion.

.2 Clean off beads, casings, joint compound droppings and the like, leave the work of this section ready for painting trades.

END OF SECTION

.1 Submit moisture, alkalinity, and mortar bond test results.

1.5 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance requirements for inclusion in the operation and maintenance manuals.

.3 Maintenance materials:

.1 Provide minimum 2% of each type and colour of tile required for the *Work* for maintenance use.

.2 Maintenance material to be of same production run as installed material.

1.6 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Execute work of this section only by a *Subcontractor* who has adequate plant, equipment, and skilled workers to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past 5 years.

.2 *Subcontractor* shall be a member company in good standing of the Terrazzo, Tile and Marble Association of Canada and have been a member for at least the past 5 years.

.2 Mock-ups:

.1 Grouted mock-up: 1220 mm x 1220 mm (48" x 48") sample panels of each tile type and colour, texture, size, and pattern of tile and grout.

.2 Non-grouted mock-up: 1220 mm x 1220 mm (48" x 48") area for each type and colour, texture, size, and pattern of tile.

.3 Install each product and colour mock-up for acceptance by *Consultant*. Accepted mock-up shall form basis of standard of workmanship for remainder of work.

.4 Mock-up shall consist of floor/wall/base corner intersection, with 300 mm (12") of finish product on each face and expansion and control joints.

1.7 Field Conditions

.1 Ambient conditions:

.1 Execute work of this section while ambient temperature and humidity within safe working temperatures in accordance with manufacturer's installation requirements for a period of 72 hours before, during and following installation. Avoid concentrated or irregular heating during curing period.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.1 Latex modified Portland cement thin bed mortar gauged:

.1 ANSI A118.4 (ANSI A108/A118/A136.1-20) and ANSI A118.11 (ANSI A108/A118/A136.1-20).

.2 White colour for translucent tile applications.

.3 Acceptable *Products*:

.1 Ardex 'X77 Microtec Fiber Reinforced Mortar' with Ardex 'E90 Mortar Admix'.

.2 Custom Building Products 'ProLite'.

.3 Flextile '51' mixed with Flextile '44'.

.4 Laticrete 'Laticrete 4237 Latex Thin Set Liquid' with 'Portland 211 Crete Filler Powder'.

.5 Mapei 'KERALASTIC' mixed with 'KERABOND'.

.6 Profix '6500' liquid latex mixed with '8500' thin set mortar.

.7 Promo Adhesives Inc. 'Pro Bond Plus' with 'Pro Bond Plus Additive'.

.8 TEC 'Superflex Ultra-Premium Thin Set'.

.2 Enriched, modified, Portland cement thin bed mortar, single component, with integral polymer:

.1 ANSI A118.4 (ANSI A108/A118/A136.1-20) and ANSI A118.11 (ANSI A108/A118/A136.1-20).

.2 White colour for translucent tile applications.

.3 Acceptable *Products*:

.1 Ardex 'X 5 Flexible Tile & Stone Mortar'.

.2 Custom Building Products 'Versabond LFT'.

.3 Flextile '52'.

.4 Laticrete '254 Platinum Multipurpose Thin-Set Mortar'.

.5 Mapei 'Ultraflex 3' or 'Ultraflex RS'.

.6 Profix 'Megaflex' thin set mortar.

.7 Promo Adhesives Inc. 'Pro HPX'.

.8 TEC 'Ultimate Large Tile Mortar'.

.2 Special mortar and setting materials:

.1 Mortar for large format tiles meeting definition under paragraph 1.2.1.1:

.1 Enriched, modified, fast-set Portland cement medium bed mortar high-hydration, low residual moisture behind the tile formula.

.2 ANSI A118.4 (ANSI A108/A118/A136.1-20) and ANSI A118.11 (ANSI A108/A118/A136.1-20).

.3 Substrate primer: in accordance with manufacturer's installation requirements.

.4 White colour for translucent tile applications and light coloured stones.

.7 Reinforcing mesh: 51 mm x 51 mm (2" x 2") mesh size, fabricated from 1.6 mm (0.06") thick galvanized steel wire; welded fabric design.

.2 Mixes:

.1 Scratch coat (by volume): 1 part Portland cement, 4 parts sand, and water or latex where required by TTMAC detail. Premixed mortar may be used per manufacturer's requirements. Adjust liquid volume may be adjusted depending on water content of sand to obtain consistency and workability.

.2 Slurry bond coat: Mix Portland cement and water to a creamy paste consistency. Include latex additive where required by TTMAC detail.

.3 Mortar bed for walls (by volume): 1 part Portland cement, 4 parts sand, and water or latex where required by TTMAC detail. Premixed mortar may be used per manufacturer's requirements. Adjust liquid volume may be adjusted depending on water content of sand to obtain consistency and workability.

.4 Levelling coat (by volume): 1 part Portland cement, 4 parts sand, and water or latex where required by TTMAC detail. Premixed mortar may be used per manufacturer's requirements. Adjust liquid volume may be adjusted depending on water content of sand to obtain consistency and workability.

.5 Mortar bed for floors (by performance): 1 part Portland cement, 4 parts sand, and water or latex where required by TTMAC detail. Premixed mortar may be used per manufacturer's requirements. Adjust liquid volume may be adjusted depending on water content of sand to obtain consistency and workability that will allow compaction during tamping of the mortar bed, and achieve minimum compressive strength of 15 MPa after 28 days.

.4 Levelling underlayment:

.1 Cement-based, quick-setting, self-levelling, self-drying underlayment for installations from featheredge to minimum 32 mm (1") thick in single application.

.2 Primer: Type as recommended by levelling underlayment manufacturer to suit substrate.

.3 Acceptable *Products*:

.1 Ardex 'Liquid BackerBoard Self-Levelling Underlayment'.

.2 Ardex 'TL 1000'.

.3 Custom Building Products 'TechLevel 100'.

.4 Flextile '5900 Flex-Flo Plus Self-Levelling Underlayment'.

.5 Laticrete 'Supercap SC500'.

.6 Mapei 'Ultraplan 1 Plus'.

.7 Promo Adhesives Inc. 'Pro Plan'.

.8 TEC 'Contractor Grade Self Levelling'.

.9 TEC 'Levelset 200'.

2.5 Grout Materials

.1 Epoxy grout:

.4 Inspect tiles for colour variation. Tiles presenting noticeable variations shall be carefully selected, set aside and used in areas where they fit in the pattern homogeneously. Provide for appropriate lighting equipment in addition to existing lighting in the immediate area where the installation is being performed so that any shade differences which are normally very slight can be identified easily.

3.2 Preparation

.1 Completely remove contaminants and deleterious substances and debris which may prevent, reduce, and affect adhesion or performance or may act as bond breaker.

.2 Wire brush steel substrates to remove deleterious substances and rust, to promote full adhesion to steel.

.3 Roughen surfaces with previously painted glossy finishes by sandpaper or other abrasive medium, and completely remove finishes which are not compatible with products specified under this section.

.4 Prime gypsum, wood or porous concrete with primer, brush or roller applied at full strength in accordance with mortar manufacturer's recommendations.

.5 Floor surfaces:

.1 Prepare concrete to receive levelling underlayment in accordance with International Concrete Repair Institute (ICRI) designation CSP-3.

.2 Prepare concrete to receive crack isolation membrane in accordance with International Concrete Repair Institute (ICRI) designation CSP-2.

.3 Concrete shall be minimum of 90 days old.

.4 At door opening locations where finished flooring is adjacent to weather-stripping or automatic door bottoms provide trowel-applied levelling compound to provide full contact between finished flooring and weather-stripping or automatic door bottoms. Taper trowel-applied levelling compound to transition with adjacent flooring substrate to be provide smooth and seamless transition at maximum slope of 3:1000 (height to distance) ratio.

.6 Alkalinity, moisture, and adhesion testing:

.1 Perform moisture and alkalinity tests and mortar bond test.

.2 Where concrete substrate exhibits higher than permitted moisture and alkalinity levels, provide water vapour reduction system and repeat moisture and alkalinity tests and mortar bond tests.

.3 Proceed with installation only after substrates pass testing. Document tests performed and submit in writing to *Consultant*.

3.3 Mixing

.1 Mix mortars, additives and grouts in accordance with manufacturer's written requirements.

3.4 Levelling Underlayment Installation

.1 Install levelling underlayment to tile flooring assemblies utilizing large format tile, except for large format tile installations over mortar bed sloped to drain.

3.7 Tile Setting

.1 Lay out tile work as indicated on drawings, and where lay-out is not indicated, lay-out tiles so tiles less than 1/2 the least dimension do not occur and with minimum amount of cutting.

.2 Using a damp towel, wipe off the back side of tile to remove any dust or other residue that may be left over from the manufacturing process.

.3 Place as much tile as possible in one operation before setting bed reaches initial set. Clean back and remove bed when it has set before tile is laid.

.4 Prime materials and by methods specified by manufacturer of bond coat.

.5 Except where tiles have setting tabs, and except for expansion, control and isolation joints, maintain joint widths as selected by *Consultant*.

.6 Back up tile coves, curbs and other shaped pieces solid with mortar. Rigidly set, reinforce or otherwise make firm and secure such pieces.

.7 Beat tiles in thoroughly and sufficiently to cause mortar ribs or notches to come together into a continuous void free bed and allow the mortar to flow up partially into the joint space to maximum of 1/3 the thickness of the tile. Sound floor tiles by tapping and reset all tiles with voids in setting bed.

.8 Tile shall contact setting materials for minimum of 95% coverage unless otherwise indicated.

.9 Obtain 100% mortar coverage with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108/A118/A136.1-20 series of tile installation standards for the following:

.1 Glass tile.

.2 Tile installed with chemical resistant mortars and grouts.

.3 Tile having any dimension 300 mm (12") or larger in any direction.

.4 Tile with raised or textured backs.

.5 Tile installation rated for Heavy or Extra Heavy Duty.

.6 Porcelain tiles with more than 20% of the tile backs covered with firing release dust back buttered so that 100% of the back is covered with mortar rated for C627, Extra Heavy Duty rating.

.10 Remove any excess setting material from the joint area so that 2/3 of the depth of the tile is available for grouting.

.11 Remove smudges or smears of setting material from the tile surface with a damp sponge or cloth immediately after final adjustment and beat-in while the mortar is fresh.

.12 Do necessary cutting and drilling of fixtures, fittings, and built-in or penetrating units without marring the tile. Replace all cracked or damaged tile.

.13 Extend tile into recesses at windows, doors, or other openings.

.14 Extend tiles 100 mm (4") behind mirrors, and fully behind cabinets, cupboards and other fixed objects at walls.

.6 Allow grout joints to become firm. Inspect joint for pinholes/voids and repair them with freshly mixed grout. Within 24 hours, check for remaining haze and remove it with warm soapy water and a nylon scrubbing pad, using a circular motion, to lightly scrub surfaces and dissolve haze/film.

.7 Grout joint width to be 6 mm (1/4") unless otherwise indicated.

.8 Do not cover, bridge or fill any expansion joints in tile with grout.

3.11 Tile Installation Tolerances

.1 Maximum allowable lippage:

.1 Tile up to 152 mm x 152 mm (6" x 6") in size: 1 mm (0.040").

.2 Tile greater than 152 mm x 152 mm (6" x 6") in size: 2 mm (0.080").

.2 Finish planes shall be straight and plumb to within 6 mm in 3 m (1/4" in 10 feet).

3.12 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00.

.1 Field tests and inspections:

.1 For concrete floor substrates subject to moisture sensitive materials, conduct the following tests in accordance with the following:

.1 Test for moisture vapour transmission in accordance with ASTM F710-21 and ASTM F1869-16a or ASTM F2170-19a in accordance with manufacturer's written installation requirements. Results must not exceed the written recommendations of the product manufacturer.

.2 Test for surface pH. Levels of pH shall not exceed the written recommendations of the product manufacturer. Test in accordance with ASTM F710-21.

.3 For each test type: Conduct 3 tests for flooring applications up to 93 m^2 (1000 square feet) in area, and 1 additional test for each additional 93 m^2 (1000 square feet) of flooring area.

.2 Adhesion bond test:

.1 Proceed with bond test after substrates have been prepared and alkalinity and moisture test have been completed.

.2 Adhesion bond test shall be completed in accordance with tile flooring and mortar setting manufacturer's written requirements.

.3 Using the specified mortar, set test tiles using mortar manufacturer's recommended trowel.

.4 After pre-determined duration, attempt to remove the test tiles by pulling up from the corners.

3.13 Adjusting and Cleaning

.1 Clean installed tile surfaces after grouting has cured.

.2 Re-point joints after cleaning to eliminate imperfections. Avoid scratching tile surfaces.

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Acoustical tile ceiling systems.

1.2 Administrative Requirements

.1 Coordination:

.1 Cooperate with mechanical and electrical *Subcontractors*.

.2 Coordinate layout and installation of acoustic ceiling units and suspension systems components with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, partition system, fire suppression system components and other work required to be incorporated in or coordinated with the ceiling system.

.2 Conduct a pre-installation meeting in accordance with Section 01 31 19.

.1 Independent inspection and testing company shall attend the pre-installation meeting.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit manufacturer's standard details.

.2 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines, and acoustical unit support at ceiling fixture.

.3 Submit reflected ceiling plans for special grid patterns as indicated.

.4 Samples:

.1 Submit sample of each component of ceiling system. Samples shall fully represent materials to be supplied in colour, texture, finish and construction.

.2 Submit samples, load test data and design tables for each type of insert to be used in the *Work* for hanger supports.

.5 Certificates:

.1 Submit certificate of compliance stating that the suspension system provided, including materials and installation, comply with the requirements of the *Contract Documents*.

.2 Interior temperature of building to range from 15°C to 30°C and relative humidity of not more than 70% before and during installation. Maintain uniform temperatures for 72 hours prior to commencement of the work of this section and maintain temperature until completion of the work of this section.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Design suspension systems for a maximum mid-span deflection not exceeding L/360 in accordance with ASTM C635/C635M-17 deflection test.

.2 Design suspension system to support safely, and without distortion, the superimposed loads of:

.1 Air supply diffusers and return grilles.

.2 Lighting fixtures.

2.2 General

.1 Single source responsibility: Obtain each type of acoustical ceiling unit and suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the *Work*. Products installed as part of the work of this section shall be from same production run.

2.3 Acoustical Tiles

.1 Lay-in acoustical tiles:

.1 Classification: Type XX, Pattern G in accordance with ASTM E1264-19.

.2 Size: 1220 mm x 610 mm.

.3 NRC: 0.85 minimum.

.4 Surface texture: Smooth.

.5 Edge: Square Tegular Narrow.

.6 Colour: White.

.7 Flame spread:

.1 Maximum values in accordance with CAN/ULC-S102-10:

.1 Flame Spread Value (FSV): 25.

.2 Smoke Developed Value (SDV): 50.

.8 Acceptable *Products*:

.1 Rockfon 'Tropic'.

.2 Substitutions: in accordance with Section 01 25 00.

2.6 Metal Finish

.1 Metal exposed in finished work shall have a pre-coated baked enamel finish in non-yellowing colour. Submit paint formulation of grid system to lighting fixture, speaker grille, sprinkler and diffuser manufacturers to ensure consistency of colour, sheen and texture of all exposed metal components in the ceiling assemblies.

.1 Colour: Flat white.

PART 3 - EXECUTION

3.1 Installation - General

.1 Install ceiling panels and metal suspension system in accordance with manufacturer's directions. Where manufacturer's directions are at variance with *Contract Documents*, notify *Consultant* before proceeding with installation.

.2 Do not commence installation until all work above suspended ceiling has been completed, inspected and accepted.

.3 Install work of this section in accordance with the 2012 Wall and Ceiling Specifications Standard Manual.

3.2 Installation - Suspension System

.1 Install suspension system rigid, secure, square, level and plumb, framed and erected to maintain dimensions and contours indicated, and in accordance with ASTM C636/C636M-19, CISCA installation standards and any other applicable national or local code requirements. Make allowance for thermal and structural movement.

.2 Attach hangers to structure with inserts and hanger supports. Do not use powder activated fasteners.

.3 Support hangers for suspended ceiling grid independent of walls, columns, pipes and ducts.

.4 Space hangers for ceilings at maximum 1220 mm (48") on centre in both directions. Provide additional hangers as required to comply with manufacturer's written installation requirements.

.5 Locate hangers at not more than 150 mm (6") from ends of main tee members.

.6 Install exposed tee members to pattern indicated. Securely attach hangers to main tee members.

.7 Exposed tees shall be as long as possible to minimize joints. Make joints square, tight, flush and reinforce with splines. Distribute joints to prevent clustering in one area.

.8 Space tee bars to suit ceiling panels and as detailed, and to accommodate lighting fixtures, diffusers and return grilles.

.9 Cooperate in the installation of ceiling systems, making adjustments where required to ensure that the lighting fixtures, supply diffusers, exhaust grilles and other built-in items properly fit into ceiling module and finish flush with rest of ceiling.

.10 Restrict creep inside module panels so that in all cases strips are centred on module lines.

.11 Install edge moulding as detailed where ceiling abuts vertical surfaces. Lap corners, use maximum lengths to minimize joints. Make joints square, tight and flush.

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Resilient skate flooring.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Samples:

.1 Submit 3 – 300 mm x 300 mm (12" x 12") sample of each type, pattern, and colour of flooring specified.

1.3 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance instructions for inclusion in the operation and maintenance manuals.

.3 Maintenance materials:

.1 Deliver 2% of each colour, pattern and type flooring material required for this project for maintenance use. Store where directed. Clearly identify each box.

.2 Maintenance materials to be same production run as installed materials.

.4 Test and evaluation reports:

.1 Submit moisture, alkalinity, and adhesive bond test results.

1.4 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 Provide work of this section, executed by competent installers with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.2 Mock-up:

.1 Prior to proceeding with permanent installation, prepare a mock-up installation for review indicating method of each type of application, edge treatment and relationships to adjoining surfaces. Minimum area shall be 15°m^2 (161°ft^2).

.2 Location of installation shall be determined by *Consultant*.

.1 Primers and adhesives: Type as recommended by flooring manufacturer compatible with materials and to suit substrate.

.2 Patching and levelling compound: Type as recommended by flooring manufacturer to suit substrate conditions and compatible with flooring adhesive and primers.

PART 3 - EXECUTION

3.1 Examination

.1 Examine substrate to ensure clean lines, correct level and freedom from cracks, ridges, dusting, scaling and carbonation.

.2 Examine floors in advance of application of flooring to ensure that floors are protected against entry of water and moisture. Perform compatibility test with primer/adhesive and substrate.

.3 Before beginning installation, verify with flooring manufacturer that substrate is properly cured, clean and dry.

.4 Verify with *Contractor*, and by visual inspection that no curing compounds and /or sealers have been applied to the concrete without prior approval of the flooring manufacturer/*Supplier*.

3.2 Preparation

.1 Ensure floor surfaces are smooth, clean and cured, with trowel finish, free from curing compounds or surface coatings, in accordance with flooring manufacturer's written installation requirements.

.2 Remove adhesives, coatings, dirt and foreign matter, excessive dusting, broken or loose concrete, and moisture which would impair bond.

.3 Substrate to be prepared in accordance with ASTM F710-21.

.4 Fill cracks, grooves, voids and /or construction joints with levelling compound as approved by manufacturer. High spots on the floor shall be removed by grinding them down.

.5 Sweep and vacuum clean substrates minimum 24 hours prior to alkalinity, moisture, and adhesion testing. Do not use sweeping compounds.

.6 Alkalinity, moisture, and adhesion testing:

.1 Test substrates in accordance with paragraph 3.4 Field Quality Control after mechanically preparing subfloor or applying patching and levelling compounds.

.2 Proceed with installation only after substrates pass testing. Document tests performed and submit in writing to *Consultant*.

3.3 Flooring Installation - Rubber Tiles

.1 Install tile flooring in accordance with manufacturer's written installation requirements.

.2 Dry-lay entire floor tile area. Check tiles for possible imperfections or defects including trim, thickness and colour. Replace any defective material prior to adhesion.

.3 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's written requirements. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.5 After 72 hours, attempt to remove the panels of flooring by pulling up from the corners.

3.5 Protection

.1 Protect exposed edges of resilient flooring, where finished and unfinished areas adjoin, by means of a reducing strip butting to and flush with the finished surface of the flooring covering material and securely adhered to the substrate material.

.2 Install reducing strips where flooring terminates. Set flush with adjacent floor finishes.

END OF SECTION

.3 Maintenance materials:

.1 Broadloom carpet: 5% in one single running length of each carpet colour installed, supplied in continuous length and in broadloom width stock and excess material having a dimension of 305 mm (12") or more.

.2 Carpet tile: 2% of each carpet colour and type specified, supplied in full size units.

.3 Maintenance materials to be same production run as installed materials.

.4 Suitably package for protection and storage, each identified with name of manufacturer and flooring material.

.5 Tag and store where directed by *Owner*.

1.5 Quality Assurance

.1 Qualifications:

.1 Installers / applicators / erectors:

.1 *Provide* work of this section, executed by competent installers with:

.1 Minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

.2 Mock-ups:

.1 Prior to commencing flooring installation for this section, prepare full room mock-up (room size at least 10 m^2 (100 ft^2) in area) for acceptance by the *Consultant*.

.2 Mock-up shall include floorings showing edge treatment and relationships to adjoining surfaces.

.3 Location of installation shall be determined by *Consultant*.

.4 Do not proceed with flooring specified in this section until mock-up has been accepted by *Contractor* and *Consultant*.

1.6 Field Conditions

.1 Ambient conditions:

.1 Ambient temperature and humidity shall comply with CRI Carpet Installation Standard 2015.

.2 Unroll and allow carpet to relax in the installation area for a minimum of 24 hours at a temperature between 18-35°C.

.3 In areas that are exposed to intense or direct sunlight, *Products* shall be protected during the conditioning, installation, and adhesive curing periods, by covering the light source.

1.7 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36.

.1 Static Electricity, no more than 3.0 KV per AATCC 134.

.2 Delamination.

.2 Mapei.

.3 Substitutions: in accordance with Section 01 25 00.

.3 Floor transition strips:

.1 Resilient transition trims: in accordance with Section 09 65 13.

PART 3 - EXECUTION

3.1 Examination

.1 Ensure that field conditions have been provided as requested and specified.

.2 Ensure that substrates have been provided as specified without holes, protrusions, cracks or unfilled control joints or depressions that would telegraph in finished carpet installation.

.3 Substrates shall be firm, structurally sound, sufficiently porous, and dry.

.4 Examine substrate to ensure clean lines, correct level and freedom from cracks, ridges, dusting, scaling and carbonation.

.5 Examine floors in advance of application of flooring to ensure that floors are protected against entry of water and moisture.

.6 Report conditions contrary to requirements preventing proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

.7 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the substrate. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

.8 Defective work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the work of this section.

3.2 Preparation

.1 Comply with recommendations of ASTM F710-19e1.

.2 Substrates shall be free of wax, oil, silicone, soap, grease, dust, solvents, sealers, curing compounds, hardeners, alkaline salts, excessive carbonation or laitance, mould, mildew, paints, varnish, asphalt, residual adhesives, adhesive removers, or other contaminants or deleterious material that may inhibit bond strength or act as a bond breaker. Remove such contaminants and deleterious material using mechanical methods recommended by manufacturer. Do not use chemical abatement methods.

.3 Flooring substrates shall be smooth and level within a tolerance of 3 mm (1/8") in a 3m (10'-0") radius.

.4 Concrete substrates that are loose, sandy, scaly, or have a white powdery surface are not acceptable. Substrates shall be mechanically prepared.

.5 Fill surface cracks, holes, score marks, depressions, and grooves, and repair surface spalls with Portland cement patching or levelling compound.

.2 Allow adhesive to set until surface becomes tacky to the touch but no adhesive is transferred.

.4 Install carpet tile in patterns as indicated.

.5 Lay carpet tiles accurately and firmly along centre lines of selected quadrants. Follow with subsequent tiles within quadrant using 'stair-step' techniques.

.6 As tiles are installed, frequently check all joints with fingers to ensure proper alignment. Do not install tiles that are out of alignment.

.7 Measure out 11 carpet tiles to attain the cumulative space gained over 10 joints, which shall not exceed 6 mm (1/4"). Repeat frequently throughout installation.

.8 Carefully butt tiles together, avoiding too much pressure which may cause peaks or buckles. Brush back face pile and tip tile into place to avoid pile being caught in joint. Anchor all cut tile and perimeter tiles with release adhesive.

.9 Make cuts from backs of tiles using templates for fitting around columns, service cut-outs and the like.

.10 Finish and adhere securely along the wall line; with a smooth, neat appearance where no wall base materials are indicated; and concealed beneath base materials where wall base materials are indicated. Base materials shall be installed after installation of carpet.

.11 Install carpet accurately fitted at perimeter of rooms, cut with precision at columns, door frames and at other obstructions. At columns and other penetrations, cut carpet with maximum possible coverage.

.12 Extend carpet tile into recesses and closets and around fixtures and service devices.

.13 Allow no traffic over installation until adhesives have fully cured, minimum 24 hours.

.14 Installed carpet shall be free from perceptible variance in colour, stains, baldness, tears, fraying, patchwork, and other defects detrimental to good performance and appearance.

3.5 Installation - Transition Trim

.1 Protect exposed edges of flooring, where finished and unfinished areas adjoining, by means of a transition trim butting to and flush with the finished surface of the flooring covering material and securely adhered to the substrate material.

.2 Set transition trim to height as required to cover carpet backing and not protrude above carpet fibres. Review heights with *Consultant* not later than 5 days prior to installation.

.3 Allow coiled vinyl material to lay flat for at least 24 hours at ambient temperatures specified above prior to installation.

.4 Set to ensure installation is free of gaps.

.5 Install transition trim in longest lengths possible.

.6 Install transition trim straight to maximum variation of 3 mm (1/8") over 3 m (10'-0").

.7 Scribe and fit transition trim to obstructions.

.8 Fit transition trim joints tightly, straight and vertical as applicable and not less than 610 mm (24") from corners.

.9 Mitre transition trim corners.

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Painting of exterior paintable surfaces.

.2 Painting of interior paintable surfaces.

.2 Paintable and non-paintable surfaces:

.1 Paint and finish paintable surfaces included in the *Work*, except where excluded by the *Contract Documents*.

.2 The following surfaces are considered non-paintable, except as otherwise indicated or scheduled:

.1 Material and equipment furnished prime and finish painted.

.2 Internal surfaces of steel tanks and stacks.

.3 Sprayed fire-resistive materials.

.4 Exterior concrete.

.5 Stainless steel, weathering steel, copper, bronze, chromium plate, nickel, anodized or lacquered or mill finished aluminum, Monel metal.

.6 Insulation, glass, plastic, brick, stone.

.7 Metallic and mastic insulation finishes.

.8 Abrasive material finishes on floors, stair treads, stair nosing and landings.

.9 Insulated electric cables.

.10 Machined parts of machinery and equipment.

.11 Concealed surfaces.

.12 Manufactured finish materials.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets and list of *Products* proposed for use in the work of this section as identified in 'Approved Product List' section of the MPI Architectural Painting Specification Manual. Correlate *Products* to Schedule furnished by *Consultant*.

.3 Samples:

.1 Samples for initial paint colour and finish selection:

.1 Submit manufacturer's colour charts showing full range of colours available, including light and deep dark tones, for each type of finish material indicated for colour selection by *Consultant*.

.2 Mock-ups:

.1 Provide mock-ups of each paint system for indicated surfaces of each colour and finish selected to verify preliminary paint selections made under Sample submittals.

.2 Mock-ups shall be located to areas as directed by *Consultant* under lighting conditions matching final area lighting, for acceptance by *Consultant*.

.3 Mock-ups shall demonstrate aesthetic effects of paint colour and sheen and shall set quality standards for material and execution of the *Work*. Final approval of colour and finish selections shall be based on mock-ups. If colour selections are not approved, apply additional mock-ups of additional colours selected by *Consultant* at no added cost to the *Owner*.

.4 Do not proceed with work, including ordering of paint *Products*, until mock-ups of each paint colour and finish and paint system for indicated surfaces have been reviewed and accepted by *Consultant*.

.5 Provide the following in-situ mock-ups:

.1 Concrete block, concrete and gypsum board: 9.3 m^2 (100 ft^2) of vertical and horizontal surfaces.

.2 Hollow metal doors and frames: 1 door and frame for each finish specified.

.6 Upon completion and approval, mock-ups shall serve as a standard for the balance of the work of this section. Subsequent work carried out and not in the *Consultant's* opinion equal to standard shall be repainted without charge.

1.5 Delivery, Storage, and Handling

.1 Deliver painting materials in sealed, original labelled containers bearing manufacturer's name, brand name, type of paint or coating and colour designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

.2 Store paint *Products* and materials in original labelled containers in secure (lockable), dry, heated and well ventilated single designated area meeting minimum requirements of both paint manufacturer and authorities having jurisdiction, and at a minimum ambient temperature of 7°C.

.3 Protect floor and wall surfaces of storage area. Protect floors with sheets or clean plywood or metal pans where mixing is being carried out.

1.6 Field Conditions

.1 Ambient conditions:

.1 Comply with environmental requirements of MPI Manual.

.2 Perform no painting work when ambient air and substrate temperatures are below 10°C for both interior and exterior work, unless suitable weatherproof covering and sufficient heating and ventilation facilities are in place in accordance with MPI Manual.

.3 Perform no painting work when relative humidity is above 85% or when dew point is less than 3°C (5°F) variance between air/surface temperature.

.3 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following MPI values:

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 maximum
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to3 5	35 minimum
G5	Semi-gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

PART 3 - EXECUTION

3.1 Examination

.1 Prior to commencement of work of this section, thoroughly examine surfaces scheduled to be painted.

.2 Check moisture content and alkalinity of surfaces to be painted in accordance with paragraph above titled Field Conditions.

.3 Inspect surfaces to be coated for gouges, marks, nibs, and other defects and properly prepare patching, filling, smoothing or other surface preparation necessary to ensure satisfactory finish.

.4 Report in writing any condition adversely affecting work of this section.

.5 Proceed with work only when surfaces and conditions are satisfactory. Remove dust, grease, rust, scale and extraneous matter, tool and machine marks and insects from surfaces which could be detrimental to a satisfactory and acceptable finish.

3.2 Preparation

.1 Comply with manufacturer's written requirements and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

.2 Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

.1 After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

.3 Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, mildew, grease, and incompatible paints, encapsulants, and other deleterious materials.

.4 Paint surfaces when moisture content or alkalinity of surfaces to be painted comply with paragraph 3.5 Field Quality Control / Standard of Acceptance.

.5 Concrete substrates: Remove release agents, curing compounds, efflorescence, and chalk.

.6 Masonry substrates: Remove efflorescence and chalk.

.3 Conduit.

.4 Diffusers.

.5 Ductwork.

.6 Grilles.

.7 Hangers.

.8 Heaters.

.9 Fire hose cabinets.

.10 Fire extinguisher cabinets.

.11 Louvres.

.12 Radiators.

.13 Stacks.

.14 Vents.

.2 Prime and paint exposed insulated and bare pipes. Prime and paint exposed conduits and electrical raceways, fittings, outlet boxes, junction boxes, pull boxes and similar items. Use heat resistant epoxy paint on pipes and surfaces where operating surface temperature exceeds 65°C.

.3 Coordinate the painting of pipes, and coverings with mechanical contractor applying colour banding, flow arrows and pipe identification after the painting of pipes and coverings.

.4 Paint work to match adjacent walls and ceilings unless directed otherwise.

.5 Paint interior surfaces of air ducts and pipe trenches including heating pipes and elements that are visible through grilles and louvres with one coat of flat metal paint to limit of sight-line. Paint to be black or white as directed by *Consultant*.

.6 Gas pipes, whether concealed or exposed, shall be painted in accordance with gas code.

.7 Paint and finish wall surfaces behind convectors. Walls to be finished prior to installation of convector covers. Touch up walls after covers are installed as necessary to make good installation damage.

.8 Air diffusers shall be primed and finished with 2 coats of paint of same colour and sheen as ducts and/or ceiling.

3.5 Field Quality Control / Standard of Acceptance

.1 Conduct quality control in accordance with Section 01 45 00.

.1 Field tests and inspections:

.1 Paint and Coating Quality Assurance Inspections:

.1 Field quality control shall be in accordance with Section 01 45 00.

.2 Moisture and alkalinity testing:

.1 Check moisture content of surfaces to be painted using properly calibrated electronic moisture meter approved by paint manufacturer, and *Consultant*, or other approved method. Maximum moisture contents shall be in accordance with manufacturer's recommendations and as follows:

3.6 Adjusting and Cleaning

.1 Promptly as work proceeds and on completion of *Work*, remove paint where spilled, splashed or spattered during the progress of the *Work*. Keep the premises free from unnecessary accumulation of tools, equipment, surplus materials and debris; at the conclusion of the work leave the premises clean.

3.7 Exterior Paint Systems

.1 System references listed are based on MPI Manual and are Premium Grade, High Performance Architectural, unless otherwise indicated:

.1 Structural steel:

.1 EXT 5.1D Alkyd (over alkyd primer); gloss level: G5.

.2 Galvanized metal (not chromate passivated): (for high contact / high traffic area doors, frames, railings, misc. steel, pipes, etc.; for low contact / low traffic area overhead decking, ducts, gutters, flashing, etc.)

.1 EXT 5.3B Alkyd finish; gloss level: G5.

.3 Dressed lumber: (bench slats, etc.)

.1 EXT 6.3G Polyurethane, clear finish.

3.8 Interior Paint Systems

.1 System references listed are based on MPI Manual and are Premium Grade, High Performance Architectural, unless otherwise indicated:

.1 Concrete vertical surfaces: (including ceilings)

.1 INT 3.1C High performance architectural latex; gloss level G3.

.2 Concrete masonry unit assemblies:

.1 INT 4.2D High performance architectural latex (over latex block filler); gloss level G3.

.3 Primed ferrous metal; touch-up and finish coats required under this section:

.1 Ferrous metal fabrications: Prepared and primed in accordance with Section 05 50 00.

.2 INT 5.1R High performance architectural latex; gloss level G5.

.4 Galvanized metal: (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.)

.1 INT 5.3M High performance architectural latex; gloss level G5.

.5 Dimension lumber: (underside of decking, etc.)

.1 EXT 6.2P Stain, semi-transparent, water based.

.6 Plaster and gypsum board: (gypsum wallboard, drywall and textured finishes)

.1 INT 9.2B High performance architectural latex finish:

.1 Gloss level:

.1 Walls, except as otherwise indicated: G3.

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Washroom accessories.

.2 Janitor room accessories.

1.2 Administrative Requirements

.1 Coordination:

.1 Supply manufacturer's handling instructions, anchorage information, roughing-in dimensions, templates and service requirements for installation of the work of this section, and assist or supervise, or both, the setting of anchorage devices and construction of other work incorporated with *Products* specified in this section in order that they function as intended.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Samples:

.1 Submit 3 samples of each finish specified.

.4 Shop drawings:

.1 Include plans, elevations, hardware, and installation details.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance instructions for inclusion in the operation and maintenance manuals.

1.5 Delivery, Storage, and Handling

.1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

.2 Deliver products to location at the *Place of the Work* designated by *Contractor*.

PART 2 - PRODUCTS

2.1 Manufacturers

.1 Subject to compliance with requirements, provide products by one of the following:

.1 ASI Watrous Inc.

.2 Variation from indicated position: 3 mm (1/8").

3.5 Adjusting and Cleaning

.1 Verify under work of this section that installed *Products* function properly, and adjust them accordingly to ensure satisfactory operation. Test mechanisms, hinges, locks, and latches and adjust and lubricate to ensure washroom accessories are in perfect working order.

.2 Do not remove protective coatings until final cleaning, or earlier if directed by *Consultant*.

.3 Refinish damaged or defective work so that no variation in surface appearance is discernible. Refinish work at *Place of the Work* only if approved.

END OF SECTION

.14 Base:

.1 Built-up curb: in accordance with Section 09 22 00/09 29 00.

.15 Number plates: Each door shall have a number plate riveted onto body or door pull, numbered sequentially starting at "1" for each locker Type as directed by the *Consultant*.

.16 Locker finish; exposed and semi-exposed surfaces: baked on polymer powder or alkyd enamel, standard colour to later selection by the *Consultant*. Frame colour shall match door colour unless otherwise indicated.

.17 Acceptable manufacturers:

.1 ASI.

.2 Spacesaver.

PART 3 - EXECUTION

3.1 Installation

.1 Assemble and install lockers in accordance with manufacturer's written installation requirements.

.2 Securely fasten at least every third locker through to wall studs, masonry or concrete substrate.

.3 Install trim and filler panels where required for continuous appearance and where obstructions occur. Specific conditions as indicated.

.4 Install finished end panels to exposed ends of locker banks.

3.2 Installation Tolerances

.1 Install plumb, level, tight and secured. Comply with the following tolerances:

.1 Plumb and level: 3 mm (1/8").

.2 Variation from indicated position: plus/minus 3 mm (1/8").

END OF SECTION

.1 Level base with drain pan.

.2 Minimum 46 mm (1-3/4") deep x area indicated on drawings.

.3 Recessed frame, extruded 6105-T6 aluminum alloy tread rails joined mechanically by extruded 6061-T6 aluminum alloy key lock bars, tread rails shall incorporate vinyl cushion.

.4 Drain pan: 1.5 mm (1/16") aluminum waterproof pan.

.5 Finish: clear anodized.

.6 Tread insert:

.1 Vinyl insert: Flexible dual durometer vinyl insert.

.1 Colour: to later selection by *Consultant* from manufacturer's standard range.

.7 Furnish anchors for attachment to, or casting in, concrete.

.2 Approved alternate: McGill Architectural Products.

2.2 Fabrication

.1 Fabricate products with materials and component sizes, metal gauges, hardware, reinforcing, anchors, and fastenings of adequate strength to ensure that foot grilles will remain free of warping, buckling, opening of joints and seams, and distortion within limits of intended use.

PART 3 - EXECUTION

3.1 Preparation

.1 Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

.1 Do not proceed until unsatisfactory conditions have been corrected.

.2 Manufacturer shall offer assistance and guidance to provide a template of irregular shaped grid assemblies where applicable to ensure a proper installation.

3.2 Installation

.1 Install the work of this section in accordance with the manufacturer's written requirements.

.2 Set grid type at height recommended by manufacturer for most effective cleaning action.

.3 Include reinforcing, anchorage and mounting devices required for the installation of each *Product*.

.4 Back paint components where contact is made with building finishes to prevent electrolysis.

3.3 Adjusting and Cleaning

.1 Verify that installed *Products* function properly, and adjust them accordingly to ensure satisfactory operation.

END OF SECTION

TABLE OF CONTENTS

Division 22

22 05 00 Mechanical Work General Instructions
22 05 15 Mechanical Basic Materials and Methods
22 13 16 Plumbing Systems
22 42 16 Plumbing Fixture and Fittings

Division 23

23 05 13 Air Handling
23 05 15 Air Distribution
23 05 93 Testing, Adjusting and Balancing
23 07 13 Insulation
23 11 23 Power and Heat Distribution

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 The "General Conditions," the "Supplementary Conditions" and all Sections of Division 1 apply to and are a part of this Section of the Specification.

1.2 APPLICATION

.1 This Section applies to and is an integral part of all Sections of Division 22/23 of the Specification.

1.3 DEFINITIONS

.1 The following are definitions of words found in Sections of Division 15 of the Specification and on associated drawings:

.1 "concealed" - means hidden from normal sight in furred spaces, shafts, ceiling spaces, walls and partitions;

.2 "exposed" - means work normally visible, including work in equipment rooms, tunnels, and similar spaces;

.3 "provide" (and tenses of "provide") - means supply and install complete;

.4 "install" (and tenses of "install") - means secure in position and connect complete;

.5 "supply" - means supply only;

1.4 EXAMINATION OF SITE/SCOPE OF WORK

.1 Carefully examine all conditions at the site that will or may affect mechanical work, and become familiar with site conditions, the building construction, finishes, and work associated with mechanical work in order that your Bid Price includes for everything necessary for completion of the mechanical work.

1.5 PLANNING AND LAYOUT OF WORK

.1 The exact locations and routing of mechanical and electrical services shall be properly planned, coordinated and established with all affected trades prior to installation such that the services will clear each other as well as any obstructions. Generally, give the right of way to piping requiring uniform pitch and locate and arrange other services to suit.

.2 Prepare working detail drawings, supplementary to the contract drawings, when deemed necessary by the Consultant, for all areas where a multiplicity of services and/or equipment occur, or where the work due to architectural and structural considerations involves special study and treatment. Submit working detail drawings to the Consultant in shop drawing form for review before the affected work is installed.

.3 Carry out all alterations in the arrangement of work that has been installed without proper co-ordination, study, and review, even if in accordance with the contract documents, in order to conceal the work behind finishes, or to allow the installation of other work, without additional cost. In addition, make any alterations necessary in other work required by such alterations, without additional cost.

1.8 SHOP DRAWINGS

.1 Submit for review, properly identified and dimensioned shop drawings showing in detail the design, construction and performance of equipment and materials as requested in Sections of Division 15 of the Specification.

.2 Endorse each shop drawing copy "CERTIFIED TO BE IN ACCORDANCE WITH ALL REQUIREMENTS," include your company name, the submittal date, and sign each copy. Shop drawings that are received and are not endorsed, dated and signed will be returned for resubmittal. The number of copies of shop drawings shall be ten (10).

.3 The Consultant will review shop drawings and will indicate his review status by stamping shop drawing copies as follows:

.1 "REVIEWED" or "REVIEWED AS NOTED" - If the Consultant's review of shop drawing is final, the Consultant will stamp the shop drawing "REVIEWED" or "REVIEWED AS NOTED" (appropriately marked);

.2 "RETURNED FOR CORRECTION" - If the Consultant's review of shop drawing is not final, the Consultant will stamp the shop drawing "RETURNED FOR CORRECTION," mark the submission with his comments, and return the submission. Revise the shop drawing in accordance with the Consultant's notations and resubmit.

.4 It is understood that the following shall be read in conjunction with the wording on the Consultant's shop drawing review stamp applied to each and every shop drawing submitted:

"THIS REVIEW BY THE CONSULTANT IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THIS REVIEW DOES NOT MEAN THAT THE CONSULTANT APPROVES THE DETAIL DESIGN INHERENT IN THE SHOP DRAWINGS, RESPONSIBILITY FOR WHICH REMAINS WITH THE CONTRACTOR, AND SUCH REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS OR OF HIS RESPONSIBILITY FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. BE RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE, FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCESSES OR TO TECHNIQUES OF CONSTRUCTION AND INSTALLATION, AND FOR CO-ORDINATION OF THE WORK OF ALL SUBTRADES."

1.9 WORK STANDARDS

.1 Where regulatory codes, standards and regulations are at variance with the drawings and Specification, the more stringent requirement will apply.

.2 Where any code, regulation, by-law or standard is quoted it means, unless otherwise specifically noted, the current edition including all revisions or amendments at the time of the contract. Where references are made to printed instructions, it means the current edition of such instructions.

1.15 RECORD (AS-BUILT) DRAWINGS

.1 The drawings for this project have been prepared on a CAD system using Autocad Release 2020 software. For the purpose of producing record "as-built" drawings, copies of contract drawings may be purchased from the Engineer, at the Contractor's expense of $25.00 CDN plus GST, per drawing, up to the first ten (10) drawings and $5.00 CDN plus GST, per drawing for all additional drawings thereafter.

.2 When work begins at the site, clearly and accurately mark on a bound set of white prints of the contract drawings, on a daily basis, all changes and deviations from the routing of piping and ductwork and locations of equipment shown on the contract drawings. Changes and deviations include those made by addenda, change orders, and site instructions, and changes and deviations indicated on supplemental drawings issued with addenda, change orders, and site instructions. Maintain the "as-built" white prints at the site for periodic inspection by the Consultant throughout the duration of the work.

.3 Pay particular attention to accurately dimensioning the location of all concealed services terminated for future extension, all buried work and services and work concealed within the building in inaccessible locations.

.4 Before applying for a Certificate of Substantial Performance of the Work, update a clean copy of the Contract Document drawing set in accordance with the marked-up set of "as-built" white prints including all deviations from original Contract Document drawings, thus forming an "as-built" drawing disk set. Submit the "as-built" site drawing prints, to the Consultant for review. Make necessary revisions to drawings to the satisfaction of the Consultant.

.5 Use the final reviewed "as-built" drawing set to provide CAD files of the drawings and reproducible mylar drawing set thus forming true "as-built" set of contract drawings. Convert the final CAD drawing files to PDF files either by software or by scanning the hardcopies. Load both CAD drawing files and PDF files onto compact discs (CD's). Provide two complete sets of as-built drawings on CD's. Submit the "as-built" sets of white prints, mylar prints and discs to Consultant.

.6 All submitted drawings shall be of the same quality as original contract drawings. The CAD drawings shall be of the form compatible to the existing AutoCad software.

1.16 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

.1 For each item of equipment for which a shop drawing is required (except for drains, plumbing fixtures and trim, and similar simple equipment), supply three (3), specific, indexed copies of equipment manufacturer's operating and maintenance instruction data manuals. Consolidate each copy of the data in an identified hard cover three-ring binder. Each binder shall include:

.1 a copy of each "reviewed" shop drawing;

.2 complete explanation of operation principles and sequences;

.3 complete part lists with numbers;

.4 recommended maintenance practices and precautions;

.5 copies of all inspection certificates issued by regulatory authorities, including pressure vessel inspection certificates;

1.18 EQUIPMENT AND MATERIALS

.1 Provide Canadian manufactured products wherever possible and where required quality and performance is obtainable. Unless otherwise specified, all materials and apparatus shall be new and shall comply with applicable Canadian Standards Association (CSA) Standards and/or Underwriters Laboratories of Canada (ULC) Standards and the requirements of the authorities having jurisdiction. Unless otherwise specified, similar products i.e.: all valves, all control components, all vibration isolation, etc., shall be the product of one (1) manufacturer.

.2 Materials and equipment scheduled and/or specified, have been selected to establish a performance and quality standard, and, in some instances, a dimensional standard. In most cases, base specified manufacturers are stated for material and equipment, specified by manufacturer's name and model number. Unless otherwise noted, the Bid Price may be based on materials and equipment supplied by any of the manufacturers named as acceptable for the particular material or equipment. If acceptable manufacturers are not stated for a particular material or piece of equipment, base the Bid Price on material supplied by the base specified manufacturers.

.3 If materials or equipment supplied by a manufacturer named as acceptable are used in lieu of the manufacturer specified, be responsible for ensuring that the substituted material or equipment is equivalent in quality, performance and operating characteristics (including energy consumption if applicable) to the specified materials or equipment, and, it shall be understood that any additional costs, and changes to associated or adjacent work resulting from provision of materials supplied by a manufacturer other than the specified manufacturer is included in the Bid Price. In addition, in equipment spaces where equipment named as acceptable is used in lieu of specified equipment and the dimensions of such equipment differs from the specified equipment, prepare and submit for review, accurately dimensioned layouts of rooms affected.

.4 In addition to the manufacturers specified or named as acceptable, other manufacturers of materials or equipment may be proposed to the Consultant for acceptance, listing in each case a corresponding credit for each alternative proposed, however, the Bid Price must be based on equipment or materials specified or named as acceptable. Certify in writing to the Consultant that the proposed alternative meets all space, power, design, energy consumption, and all other requirements of the specified or acceptable material or equipment. In addition, it shall be understood that there will be no increase in the contract Price by reason of any changes to associated equipment, mechanical and/or electrical, required by acceptance of proposed alternatives. The Consultant has sole discretion in accepting any such proposed alternative material or equipment.

.5 Where products you intend to provide are proposed as "an equal" and/or "or approved equal," to specified products, certify in writing that the proposed product to be used in lieu of specified product, at least meets space, power, design, energy consumption, noise criteria and other requirements of the specified product and thus shall be equivalent to or better than the specified product. When requested by the Consultant, provide full design detail drawings and specifications of proposed products. Acceptance of these "or equal" and/or "or approved equal" products shall be at the sole discretion of the Consultant. The Consultant's decision shall be final and shall not require explanation. There shall be no increase in the contract Price due to the Consultant's rejection of a proposed equivalent product.

.6 Only base specified products specified acceptable products or equipment listed as alternate will be considered for acceptance. No proposed substitutions will be accepted.

1.22 ENERGY EFFICIENCY OF PRODUCTS

.1 Unless otherwise specified, material and equipment supplied shall meet or exceed minimum efficiencies and/or minimum performances of ASHRAE Standard ASHRAE/IES 90.1-2010.

PART 2 - PRODUCTS

NIL

PART 3 - EXECUTION

NIL

END OF SECTION 22 05 00

LIST OF CONTENTS (CONT'D)

3.9 INSTALLATION OF SHUT-OFF VALVES AND CHECK VALVES
3.10 VALVE TAGGING AND CHART
3.11 INSTALLATION OF PIPING STRAINERS
3.12 INSTALLATION OF PIPE HANGERS AND SUPPORTS
3.13 SUPPLY OF ACCESS DOORS
3.14 INSTALLATION OF PRESSURE GAUGES AND THERMOMETERS
3.15 INSTALLATION OF EQUIPMENT DRIVE GUARDS AND ACCESSORIES
3.16 SUPPLY OF MOTOR STARTERS AND ACCESSORIES
3.17 IDENTIFICATION PAINTING
3.18 INSTALLATION OF VIBRATION ISOLATION MATERIALS
3.19 PIPE LEAKAGE TESTING
3.20 MECHANICAL PLANT PERFORMANCE AND ACCEPTANCE TESTS
3.21 INTERRUPTIONS TO AND SHUT-DOWNS OF MECHANICAL SERVICES AND SYSTEMS
3.22 CONCRETE WORK FOR MECHANICAL SERVICES
3.23 PIPING EMBEDDED IN CONCRETE
3.24 FINISH PAINTING OF MECHANICAL WORK
3.25 CUTTING AND PATCHING FOR MECHANICAL WORK
3.26 PACKING AND SEALING CORE DRILLED PIPE OPENINGS
3.27 INSTRUCTIONS TO OWNER
3.28 INSTALLATION OF IDENTIFICATION NAMEPLATES
3.29 MOTOR STARTER SCHEDULES

.3 American National Standards Institute (ANSI);

.4 Air - Conditioning and Refrigeration Institute (ARI);

.5 American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE);

.6 The American Society of Mechanical Engineers (ASME);

.7 American Society of Testing and Materials (ASTM);

.8 American Water Works Association (AWWA);

.9 National Standards of Canada (CAN);

.10 Canadian Gas Association (CGA);

.11 Canadian General Standards Board (CGSB);

.12 Canadian Standards Association (CSA);

.13 Electrical and Electronic Manufacturers Association of Canada (EEMAC);

.14 Factory Mutual Systems (FM);

.15 Institute of Electrical and Electronic Engineers (IEEE);

.16 International Standards Organization (ISO);

.17 Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS);

.18 National Environmental Balancing Bureau (NEBB);

.19 National Fire Protection Association (NFPA);

.20 Occupational Safety & Health Administration (OSHA);

.21 Ontario Building Code (OBC);

.22 Thermal Insulation Association of Canada (TIAC);

.23 Sheet Metal and Air Conditioning Contractor's National Association (SMACNA);

.24 Underwriters Laboratories of Canada Inc. (ULC).

PART 2 - PRODUCTS

2.1 PIPE SLEEVES

.1 Minimum No. 24 USS gauge (0.635 mm thick) galvanized steel with an integral flange to secure the sleeve to formwork construction.

.2 Factory fabricated, flanged, high density polyethylene sleeves with reinforced nail bosses.

.3 Schedule 40 mild galvanized steel pipe.

2.2 FIRESTOPPING AND SMOKE SEAL MATERIALS

.1 Victaulic Co. of Canada Ltd. "No-Sweat" couplings and fittings as specified hereinafter.

.2 Style "606" couplings to CSA B242-M1980, consisting of ductile iron housings to ASTM A-536 (Grade 65-45-12) with coating of copper alkyd enamel paint, pressure responsive moulded synthetic rubber gaskets to ASTM D-2000 selected by the manufacturer for the intended service, and zinc plated carbon steel nuts, bolts and washers to ASTM A-183 with minimum 110,000 psi (758,400 kPa) tensile strength.

.3 Style "641" flange adapters with ANSI Class 125 or 150 bolt hole pattern, as applicable, consisting of ductile iron housings to ASTM A-536 (Grade 65-45-12) with coating of copper alkyd enamel paint, electroplated steel hinge bushing, pressure responsive moulded synthetic rubber gaskets to ASTM D-2000 selected by the manufacturer for the intended service, and zinc plated carbon steel nuts, bolts and washers to ASTM A-183 with minimum 110,000 psi (758,400 kPa) tensile strength. Where required, flange adaptors shall be supplied with a phenolic (Type F) flange washer between flange and mating surface.

.4 Full flow, factory grooved end copper fittings to ASTM B-75 C12200 for piping sized 4" (100 mm) diameter and smaller. Fittings for piping sized larger than 4" (100 mm) diameter, shall be full flow, grooved end, cast bronze to ASTM B-584-87 CDA 844(81-3-7-9).

.5 DWV grade hard temper copper to ASTM B306-88 "Copper Drianage Water Tube (DWV)", with rolled grooved ends to manufacturer's latest published specifications.

.6 Type "L" hard drawn seamless copper, certified to ASTM B88-88 "Seamless Copper Water Tube" with rolled grooved ends to manufacturer's latest published specifications.

2.7 PROPRESS COPPER PIPE, FITTINGS AND JOINTS

.1 Viega "ProPress" couplings and fittings as specified hereinafter.

.2 Copper tubing shall conform to ASTM B 75 or ASTM B88.

.3 Copper fittings shall conform to ASME B16.18, ASME B16.22 or ASME B16.26.

.4 Copper and copper alloy press fittings shall conform to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS 117. Sealing elements for press fittings shall be EPDM. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer. Press ends shall have SC (Smart Connect™) feature design w/Smart Connect(leakage path). In ProPress ½" to 4" dimensions the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

.5 Pipe Threads shall conform to ASME B1.20.1.E.

.6 Hangers and supports shall conform to MSS-SP-58.

2.8 BLACK STEEL PIPE, FITTINGS AND JOINTS

.1 Mild black carbon steel, Grade A, ASTM A53, continuous weld fabricated for pipe with screwed joints, ASTM A53 electric resistance weld fabricated, mill or site bevelled for pipe with welded joints.

.2 Pipe for fire protection work shall be mild black carbon steel, Grade A ASTM A-795, continuous weld fabricated for pipe with screwed joints, ASTM A-795 electric resistance weld fabricated, mill or site bevelled for pipe with welded joints.

.2 Spirax Sarco Canada Ltd., float actuated air vents, type 13 WS for systems with a working pressure to 1035 kPa (150 psi), type 13 WHS for systems with a working pressure greater than 1035 kPa (150 psi), each complete with a cast iron body and cap, a stainless steel float assembly and seat, and a neoprene head.

.3 Acceptable manufacturers are Spirax Sarco Canada Ltd., ITT Bell & Gossett, Armstrong, and Braukmann.

2.14 GATE, GLOBE AND SWING TYPE CHECK VALVES

.1 Valves scheduled hereinafter are Jenkins Valves.

.2 All valves shall be, to the extent possible, the product of a single manufacturer and shall have the manufacturer's name, pressure rating and size clearly marked on the body.

.3 Valves 50 mm (2") and smaller shall be constructed of bronze. Valves 65 mm (2-1/2") and larger shall have iron bodies and bronze mountings.

.4 The bronze in bodies and bonnets of all bronze valves shall conform to ASTM B-62 for valves rated up to 1035 kPa (150 psi) steam pressure, and ASTM B61 for valves rated at 1380 kPa (200 psi) and 2070 kPa (300 psi) steam pressure.

.5 Bodies and bonnets of iron body valves shall conform to ASTM A-126, Class B.

.6 Generally, valves 75 mm (3") and smaller shall be complete with screwed ends, except for bronze valves installed in copper piping which shall be complete with soldering ends. Generally, valves larger than 75 mm (3") shall be complete with flanged ends and proper flanged adapters to copper shall be provided where flanged valves are installed in copper piping.

.7 Valves for installation in chilled water, condenser water, domestic water, heating system water and glycol solution piping with pressures less than 1035 kPa (150 psi), unless otherwise noted, shall conform to the following schedule:

VALVE TYPE	PRESSURE RATING WOG		ENDS	JENKINS FIG. NO.
BRONZE GATE	2070 kPa	(300 psi)	SOLDERING	813
BRONZE GATE	1380 kPa	(200 psi)	SCREWED	810
BRONZE GLOBE	2070 kPa	(300 psi	SCREWED	106-B
BRONZE GLOBE	2760 kPa	(400 psi)	SCREWED	2050
BRONZE CHECK	2760 kPa	(250 psi)	SCREWED	4092
BRONZE CHECK	2070 kPa	(300 psi)	SOLDERING	4093
IRON GATE	1380 kPa	(200 psi)	FLANGED	454
IRON CHECK	1380 kPa	(200 psi)	FLANGED	587

.2 Ball valves in insulated piping shall be complete with extended handles to clear insulation.

.3 Acceptable manufacturers for valves used in services other than natural gas are Jenkins Valves, Crane Canada Inc., Nibco Inc., Kitz, Milwaukee Valve Company, Newman-Hattersley, Toyo, Apollo, Victaulic Co. of Canada Ltd. and Watts Regulator of Canada Ltd.

.4 Acceptable manufacturers of valves used in natural gas service are Neo Metals, KITZ, Toyo and Newman-Hattersley.

2.16 BUTTERFLY VALVES

.1 DeZurik of Canada Ltd., Fig. No. BGS-L1, lug body type, 1200 kPa (175 psi) rated, resilient seated butterfly valves, each complete with a stainless steel shaft, corrosion resistant disc, a seat suitable in all respects for the application, and a flange arrangement which maintains tight shut-off and the valve in position when one side of the connecting piping is removed.

.2 Butterfly valves up to and including 150 mm (6") diameter shall be equipped with "ON/OFF" lever handles. Butterfly valves 200 mm (8") and larger shall be equipped with wheels and gear operators.

.3 Acceptable manufacturers are DeZurik of Canada Ltd., Keystone Ltd., Watts Industries, Jenkins Valves, Crane Canada Inc., Newman-Hattersley, Centerline, Apollo, Mueller, KITZ, Toyo, WKM and Demco

2.17 WAFER TYPE CHECK VALVES

.1 Gulf Valve Co., "WAFER CHECK", threaded lug type, ANSI Series 150, 1965 kPa (285 psi) rated at 38°C (100°F), non-slam wafer check valves, each complete with a carbon steel body, stainless steel discs, a shaft, springs, disc stop and thrust bearings constructed of type 316 stainless steel, and seat materials to suit the application. The inside diameter of the valve must be equal the inside diameter of the connecting pipe.

.2 Acceptable manufacturers are Gulf Valve Co., Checkrite, Mission (Duo-Chek II), Moygro and Victaulic Co. of Canada Ltd. (No. 715 dual disc).

2.18 LUBRICATED PLUG VALVES

.1 Neo Metals Ltd., No. AR40034 screwed and or No. AR40114 flanged or equal CGA approved, cast iron, 1035 kPa (150 psi) rated lubricated plug valves, each complete with a lubricant screw, a lubricant valve, lubricant receptacle, a loose operator, and a plug with lubricant grooves circling the passage in both the open and closed position to ensure a positive seal.

.2 Acceptable manufacturers are Neo Metals and Newman Hattersley.

2.19 VALVE IDENTIFICATION TAGS

.1 Embree Marking Systems or W.H. Brady Co., non-ferrous metal valve tags with a stamped consecutive number filled in with black paint, and a heavy-gauge non-ferrous metal chain, ring, or "S" hook for attaching the tag to a valve stem or handle.

2.20 PIPING STRAINERS

.1 Spirax Sarco Ltd., cast iron wye shaped strainers, type IF-125 screwed and/or type AF-250 flanged, each suitable for working pressures to 890 kPa (130 psi), and complete with a removable type 304 stainless steel strainer screen with perforations sized to suit the application.

.4 Where access doors are located in surfaces where special finishes are required, they shall be of a recessed door type capable of accepting the finish in which they are to be installed so as to maintain the final building surface appearance throughout.

.5 Acceptable manufacturers are Acudor Acorn Limited and The Williams Brothers Corporation.

2.23 PRESSURE GAUGES AND THERMOMETERS

.1 H.O. Trerice Co., pressure gauges, thermometers and accessories as follows:

.1 pressure gauges - No. 600 Series to ANSI Standard B40, Grade A, fully adjustable, 115 mm (4-1/2") diameter, complete with a cast aluminum casing, clear glass window, white dual scale (psi and kPa) dial, red tipped black pointer, bronze bushed movement, pressure snubber, and "T" handle gauge cock;

.2 thermometers - No. BX93403-1/2 to CAN/CGSB Standard 14.4-M88 fully adjustable angle, 225 mm (9") white dual scale (°F and °C), complete with cast aluminum case, clear acrylic window lens, front red reading mercury tubing, separable brass socket, brass piping well, and extension necks where used in insulated pipe or equipment.

.2 Thermometers in ductwork shall be equipped with Trerice No. 065-0015 or equal mounting flanges.

.3 Pressure gauge and thermometer scale ranges shall be such that the working temperature or pressure of the system for which the instrument is provided is at approximately the mid-point of the instrument scale.

.4 Pressure gauges in sprinkler fire protection piping shall be Winters, Model Q1721 or equal ULC listed pressure gauges.

.5 Instruments and associated accessories shall be registered with the Technical Standards and Safety Authority (TSSA) and shall be complete with CRN No. where possible the CRN No. shall be permanently fixed to the component.

.6 Acceptable manufacturers of pressure gauges (other than fire protection) and thermometers and related accessories are H.O. Trerice Co. Ltd., Winters, Ashcroft (Dresser Canada Inc.) and Weksler.

2.24 EQUIPMENT DRIVE GUARDS AND ACCESSORIES

.1 Guards for V-belt drives shall be removable four (4) sided, fully enclosed galvanized sheet steel guards to OSHA Standards, complete with 112 mm (4-1/2") diameter tachometer openings covered with removable perforated galvanized plates at each shaft location.

.2 Guards for flexible couplings shall be removable "U" shaped galvanized steel guards with a 2.3 mm (0.0905") thick frame and expanded mesh face.

.3 Guards for exposed fan blades, unless otherwise noted, shall be removable 19 mm (3/4") galvanized steel wire mesh with galvanized steel frames.

2.25 ELECTRIC MOTORS

.1 Motors shall conform to EEMAC Standard MG1, applicable IEEE Standards, and applicable CSA Standards unless otherwise noted.

.16 Refer to starter schedule drawing(s) for motor voltage and phase requirements.

.17 Acceptable manufacturers for motors 0.75 kW (1 HP) and larger are US Motors, TECO (Westinghouse Canada Inc.), WEG (V.J. Pamensky), Lincoln Electric Co. Ltd., and Toshiba International Corp.

.18 Acceptable manufacturers for motors less than 0.75 kW (1 HP) are Canadian General Electric Co. Ltd., Emerson Electric Canada Ltd., Baldor Electric Co. and LEESON Electric (Canada) Ltd.

2.26 MOTOR STARTERS AND ACCESSORIES

.1 Allen-Bradley Canada Ltd., NEMA type, motor starters in accordance with the following specification and the motor starter schedule(s), unless otherwise noted.

.2 Unless otherwise noted, starters for single phase motors shall be Bulletin 600, 115 volt, thermal overload protected manual starting switches with a neon pilot light, a surface or flush mounting EEMAC enclosure to suit the application, and, where automatic operation is required, a separate "hand-off-automatic" selector switch in an enclosure to match the starter enclosure. Field design and assembled starters will not be accepted.

.3 Unless otherwise noted, starters for 3-phase motors less than 37.3 kW (50 Hp), shall be combination "quick-make" and "quick-break" fused disconnects and full voltage, non-reversing magnetic starters for across-the-line service. Full protection of each phase shall be included in the starters by means of one (1) overload relay per phase per starter. Starters shall be equipped with "hand-off-automatic" switches, pilot lights, control transformers, external overload reset push button, two (2) NO and NC, and other accessories as per the starter schedule(s). Field design and assembled starters will not be accepted.

.4 Unless otherwise noted, starters for 3-phase motors 37.3 kW (50 HP) up to 112 kW (150 HP), shall be reduced voltage, non-reversing, autotransformer type starters. Full protection of each phase shall be included in the starters by means of one (1) overload relay per phase per starter. Starters shall be equipped with "hand-off-automatic" switches, pilot lights, control transformers, external overload reset push button, two (2) NO and NC contacts, and other accessories as per the starter schedule(s). Field design and assembled starters will not be accepted.

.5 Unless otherwise noted, starters for 3-phase motors 112 kW (150 HP) or larger, shall be reduced voltage, non-reversing, closed transition "wye-delta" starters. Full protection of each phase shall be included in the starters by means of one (1) overload relay per phase per starter. Starters shall be equipped with "hand-off-automatic" switches, pilot lights, control transformers, external overload reset push button, two (2) NO and NC contacts, and other accessories as per the starter schedule(s). Field design and assembled starters will not be accepted.

.6 Enclosures for starters located in sprinklered areas shall be EEMAC 2. All other loose starter enclosures shall be EEMAC 1 unless otherwise noted.

.7 Motor control centres shall be Allen-Bradley of Canada Ltd. Bulletin 2100 "CENTRELINE," 2.28 m

.7 Spring mounts for equipment located outside the building shall be factory weather-proofed by means of two (2) coats of rust resisting paint, two (2) coats of neoprene and complete with neoprene pads in lieu of standard rubber pads.

.8 Acceptable manufacturers are BVA Systems Ltd., Vibron, Masdom Corp., and J.P. Environmental Products Inc.

2.28 IDENTIFICATION NAMEPLATES

.1 Laminated plastic (lamacoid) black-white-black with bevelled edges, stainless steel screws, and proper identification engraving. Each nameplate shall be sized to suit the equipment for which it is provided, and the required wording.

.2 Minimum size is 1" high x 2" long.

2.29 GROOVED END BLACK STEEL PIPE, FITTINGS AND JOINTS

.1 Mild black steel pipe to ASTM A-120 or A53-90, with factory or site grooved ends square cut or rolled in accordance with Victaulic Co. of Canada Ltd. Specification TS215/83 and to requirements of CSA B242-M1980.

.2 Couplings shall be Victaulic Co. of Canada Ltd., ULC and FM approved grooved end pipe couplings to CSA B242-M1980, consisting of housings, gaskets, nuts and bolts. Housings shall be cast malleable (ASTM A-47) or ductile (ASTM A-536) iron cast in two (2) or more parts and secured together by heat treated carbon steel bolts and nuts confirming to ASTM A183. Gaskets shall be mechanical grooved coupling design pressure responsive elastomer gaskets, colour code green, suitable in all respects for the application.

.3 Couplings for piping risers, mains and in Equipment Rooms shall be Style 07 "ZERO-FLEX" type.

.4 Couplings for standpipe or sprinkler system piping with pressure less than 175 psi (1200 kPa) shall be style 05 "FIRELOK", other couplings shall by style 07 "ZERO-FLEX".

.5 Fittings shall be malleable or ductile iron grooved end design fittings to accept grooved mechanical couplings without field preparation. Unless otherwise noted in succeeding Sections of this Division, Victaulic "FIT" tee, elbow and similar fittings shall not be used.

.6 Acceptable manufacturers are Victaulic Co. of Canada Ltd. and Grinnell Corp.Refer to Motor Starter Schedule SS-01 and delete item #4 from this schedule.

2.30 MECHANICALLY BONDED BLACK STEEL PIPE, FITTINGS AND JOINTS

.1 Victaulic Co. of Canada Ltd., "PRESSFIT" couplings and fittings consisting of formed, precision cold drawn steel assemblies complete with O-ring seals selected by the manufacturer for the intended system service, rated to 300 psi (2070 kPa) pressure and to 230 degrees F. (110 degrees C.) temperature and ULC listed and labelled and FM approved for fire protection service to 175 psi (1205 kPa) pressure.

.2 Pipe shall be approved Schedule 5 to ASTM A-135, A-795 or A53-90 mild black steel, unless otherwise noted, supplied by the fitting manufacturer.

PART 3 - EXECUTION

3.1 GENERAL PIPING AND DUCTWORK INSTALLATION REQUIREMENTS

.15 Provide unions or flanges in piping at all connections to valves, strainers and similar piping system components which may need maintenance or repair, at all equipment connections, in long runs of piping at suitable regular intervals to permit removal of sections of piping, and wherever else indicated on the drawings.

.16 Ensure that equipment and material manufacturer's installation recommendations and instructions are followed unless otherwise noted herein or on the drawings, and unless such instructions and recommendations contradict governing codes and regulations.

.17 Carefully clean all ducts, pipe and fittings prior to installation. Temporarily cap or plug ends of pipe, ducts and equipment which are open and exposed during construction.

.18 Install piping and ductwork which shall be insulated such that they have sufficient clearance to permit insulation to be applied continuously and unbroken around the pipe or duct except at fire barriers, in which case the insulation will be terminated at each side of the fire barrier.

.19 Inspect surfaces and structure prepared by other trades before performing your work. Verify that surfaces or the structure to receive your work have no defects or discrepancies which could result in poor application or cause latent defects in installation and workmanship. Report defects in writing to the Consultant. Installation of your work will constitute acceptance of such surfaces as being satisfactory.

.20 Ensure that exposed ferrous metal products, except ductwork and piping, have at least one (1) factory prime coat of alkyd metal primer, or paint such ferrous metal products with one (1) prime coat of alkyd metal primer on the job. Clean and wire brush ferrous metal products prior to application of prime coat.

.21 For factory applied finishes, repaint or refinish surfaces damaged during shipment, erection or construction work. Quality of repair to finish shall be equal to finish provided by equipment manufacturer.

3.2 PIPE JOINT REQUIREMENTS

.1 Ream all piping ends prior to making joints.

.2 Properly cut threads in screwed steel piping and coat male threads, unless otherwise noted, with red lead, Teflon tape or paste, or an equivalent thread lubricant. After the pipe has been screwed into the fitting, valve, union, or piping accessory, not more than two (2) pipe threads shall remain exposed.

.3 Site bevel steel pipe to be welded or supply mill bevelled pipe. Remove all scale and oxide from the bevels and leave same smooth and clean. Ensure that personnel doing welding work are CWB certified welders and qualified for the particular pressure application worked on, and that all tests required by governing authorities are carried out, including X-ray tests where required for certain applications.

.4 Use Bonney Forge Ltd. or equal welding tees or welding outlet fittings for piping branches off mains, welded or socket type for pipes with welded fittings and threaded type for pipes with screwed fittings.

.5 Make all flanged joints with Cranite Ltd. or equivalent gasket materials to suit the application, and suitable bolts and nuts. Bolts shall not be longer than the length necessary to screw the nut up flush to the end of the bolt.

.6 Bolts used for flanged connections in all piping with a working pressure of 100 psi (690 kPa) and greater shall be ASTM A-193, Grade B-7, with heavy hexagon nuts to ASTM A-194, CL-2H.

.5 Size sleeves, unless otherwise noted, to leave 12 mm (1/2") clearance around the pipes, or where pipe is insulated, a 12 mm (1/2") clearance around the pipe insulation.

.6 Pack and seal the void between the pipe sleeves and the pipe or pipe insulation for the length of the sleeves as follows:

.1 pack sleeves in fire rated construction as specified hereinafter in the Article entitled "INSTALLATION OF FIRESTOPPING AND SMOKE SEAL MATERIALS";

.2 pack sleeves in non-fire rated interior construction with mineral wool and seal both ends of the sleeves with non-hardening silicone base caulking compound;

.3 in exterior sleeves with watertight "Link Seal" (Corrosion Service Company Ltd., Telephone No. 416-630-2600) mechanical seal assemblies installed between each sleeve and pipe;

.4 pack sleeves in exterior walls with lead wool or oakum and seal both ends of the sleeves water-tight with approved non-hardening silicone base caulking compound.

.7 Where sleeves are required in masonry work, accurately locate and mark the sleeve position, and turn the sleeves over to the trade performing the masonry work for installation.

.8 Terminate sleeves for piping which will be exposed so that the sleeve is flush at both ends with the wall, partition or slab surface so that the sleeve may be completely covered by an escutcheon plate, except for sleeves in waterproof floors which are to extend 100 mm (4") above the finished surface.

.9 "Gang" type sleeving will be permitted only with the approval of the Consultant.

.10 Where sleeves are provided for future piping, or where piping has been removed from existing sleeves, cap and seal both ends of the sleeved opening to the approval of the Consultant.

3.4 DUCT, DAMPER AND SIMILAR MATERIAL OPENINGS

.1 Duct openings, air inlet and outlet openings, fire damper and similar openings will be provided in poured concrete work, masonry, drywall and other building surfaces by the trade responsible for the particular construction in which the opening is required.

.2 Ensure that openings for fire dampers to 350 mm (14") high are sized to suit the damper arrangement with the folding blade out of the air stream.

3.5 SLEEVE AND FORMED OPENING LOCATION DRAWINGS

.1 Prepare and submit for review and forwarding to the concrete reinforcement detailer, drawings indicating all required sleeves, recesses and formed openings in poured concrete work. Such drawings shall be completely and accurately dimensioned and relate sleeve, recesses, and formed openings to suitable grid lines and elevation datum.

.2 Begin to prepare such drawings immediately upon notification of acceptance of tender and award of contract.

3.6 INSTALLATION OF FIRESTOPPING AND SMOKE SEAL MATERIALS

.7 Provide reinforcing or connecting supports where required to distribute the loading to the structural components.

.8 Do not use wood plugs and hammer impact fasteners. Anchors in floor topping fills are not acceptable. Secure anchors in floors to the structure.

.9 Where a performance requirement is specified, submit engineering calculations and written verification signed by a registered professional engineer that the installation has been inspected and is structurally sound and in accordance with design requirements.

.10 Fastenings which cause spalling or cracking of the structure or products to which anchorage is made are not acceptable.

.11 Obtain the Consultant's consent before using explosive actuation fastening devices. If consent is obtained, comply with CSA A166-1975.

.12 Space anchors within limits of load bearing or shear capacity and ensure they provide positive permanent anchorage.

3.9 INSTALLATION OF SHUT-OFF VALVES AND CHECK VALVES

.1 Provide shut-off valves in piping connections to equipment, to isolate piping risers and other sections of systems as shown, and wherever else indicated on the drawings.

.2 Provide a check valve in the discharge piping of every pump, and in piping wherever else shown.

.3 Shut-off valves in piping where a balancing or throttling effect is required such as inlet piping to water coils shall be globe type unless otherwise noted. All other shut-off valves shall be ball type to and including 50 mm (2") diameter, butterfly type 65 mm (2-1/2") diameter or larger, or, where required, gate type.

.4 Ball valves shall not be used in piping conveying fluid below 15°C (60°F).

.5 Shut-off valves in natural gas piping shall be lubricated plug types for piping larger than 50 mm (2") and for piping 50 mm (2") and smaller including branch piping connections to equipment, CGA approved ball type valves.

.6 Do not use ball or butterfly valves to replace globe valves.

.7 Check valves shall be swing check type installed in horizontal piping, however, provide lug body type wafer check valves in vertical piping where space conditions do not permit the use of swing type check valves in horizontal piping.

.8 Note that discharge accessories provided with vertical in-line circulating pumps specified in Section 15700 are complete with integral check valves.

.9 Valve stems in horizontal piping shall be pitched upward.

.10 Locate all shut-off valves in piping such that valve handles are positioned for easy operation. Wherever possible, install shut-off valves at uniform height.

3.10 VALVE TAGGING AND CHART

.1 Attach a numbered valve tag (with service identification) to each new valve, and valves immediately at the apparatus they control. Valve tag numbering must be approved by the Consultant.

	25 mm to 150 mm (1" To 6")	2.4 m (8') Intervals
	200 mm (8") & up	3 m (10') Intervals
Copper	To 25 mm (1")	1.8 m (6') Intervals
	25 mm (1-1/2") & Up	2.4 m (8') Intervals

.7 Unless otherwise specified support vertical pipes by means of supports specified in PART 2 of this Section at maximum 3.6 m (12') intervals or at every floor, whichever is lesser.

.8 Support vertical cast iron hub and spigot pattern piping at the hubs by means of a clamp bolted around the pipe and anchored to the floor or wall.

.9 Support all vertical cast iron plain end pipe (mechanical joint type), as for hub and spigot pipe but secure the clamp around the pipe under a flange integral with the pipe for vertical support purposes, or provide a length of hub and spigot pipe to facilitate proper support.

.10 Provide roller hangers or supports for all piping 50 mm (2") diameter and larger and conveying a material 38°C (100°F) or greater where required to facilitate pipe movement due to expansion and contraction, and equip the piping with steel protection saddles at roller locations to protect the piping insulation.

.11 Provide pipe covering shields, sized to suit insulated pipe, between insulated pipe and the pipe hanger or support for all piping not supported by roller hangers and/or supports.

.12 Support bare copper tubing using specially made copper or plastic coated copper tubing hangers, or provide proper plastic inserts or tape to isolate ferrous hangers and supports from contact with the bare copper tubing.

.13 Where pipes having the same slope are grouped and a common hanger or support is used, space the hanger or support to suit the spacing requirement of the smallest pipe in the group.

.14 Where pipes change direction, either horizontally or vertically, provide a hanger or support on the horizontal pipe not more than 300 mm (12") from the elbow. Where pipes drop from tee branches, support the tees in both directions not more than 50 mm (2") on each side of the tee.

.15 Provide all additional structural steel channels, angles and similar accessories required for support of pipes.

.16 Do not use perforated band, wire, chain or solid ring hangers.

.17 Do not pierce ductwork with hanger rods, and do not support piping from ductwork or duct support hardware.

3.13 SUPPLY OF ACCESS DOORS

.1 Supply access doors to give access to all valves, cleanouts, strainers, duct access doors, and other similar mechanical work which may need maintenance or repair but which is concealed in inaccessible construction, except as otherwise specified herein or on the drawings.

.2 Locate access doors in walls and partitions to the Consultant's approval, and arrange mechanical work to suit. Arrange mechanical work in ceiling spaces to suit access door locations shown on the reviewed and approved Sepia prints of reflected ceiling plan drawing(s) submitted as per PART 1 of this Section.

.2 Secure guards to the equipment or equipment base but do not bridge sound or vibration isolation.

.3 Where equipment oil level gauges, oil reservoirs, grease cups or grease gun fittings are integral with the equipment but are not easily accessible for service, extend to accessible locations.

3.16 SUPPLY OF MOTOR STARTERS AND ACCESSORIES

.1 Unless otherwise noted, supply a motor starter for each item of motorized equipment which you provide.

.2 Where 3-phase starters are indicated and scheduled in motor control centre enclosures, supply the control centres complete with starters and bolt the assemblies to concrete housekeeping pads where shown.

.3 Where package type equipment with integral starters, or equipment with starters integral in loose control panels supplied with the equipment (either by Division 15 or as part of the work of other Divisions) is fed from a motor control centre, provide a disconnect switch in the motor control centre in lieu of a starter. Refer to the starter schedule(s) for requirements.

.4 "Line" side power wiring to motor control centres and "load" side power wiring from control centres to equipment will be done as part of the electrical work of Division 16.

.5 Unless otherwise noted or shown on the drawings, single phase starters will be mounted adjacent to the equipment they serve and connected complete as part of the electrical work of Division 16. Hand the starters to the electrical trade at the site at the proper time.

.6 Motor starter interlocking will be done as part of the electrical work of Division 16 in accordance with requirements specified in this Division (15), and as outlined on the starter schedule(s). Equip each starter to be interlocked with all required contacts and control connection accessories.

.7 Provide an identification nameplate on each motor starter or disconnect located in a motor control centre or on a motor starter panel, on each individually mounted starter which you supply, and on each disconnect which is provided by Division 16 for motorized equipment which you supply.

3.17 IDENTIFICATION PAINTING

.1 Provide pipe, duct and equipment identification as specified below:

.2 Identify exposed piping and ductwork in locations as follows:

.1 at every end of every piping or duct run;

.2 adjacent to each valve, strainer, damper and similar accessory;

.3 at each piece of connecting equipment;

.4 on both sides of every pipe and duct passing through a floor, wall or partition, unless otherwise noted;

.5 at 6 m (20') intervals on pipe and duct runs exceeding 6 m (20') in length;

.6 on each side of special valves, special fittings and branch connections;

.2 Supply to the vibration isolation material manufacturer or supplier a "reviewed" shop drawing copy for each piece of equipment to be isolated, and dimensioned pipe layouts of associated piping to be isolated. Unless otherwise noted, all vibration isolation materials shall be the product of one (1) manufacturer.

.3 Unless otherwise indicated, install isolation materials for base mounted equipment on concrete housekeeping pad bases which extend at least over the full base and isolator area of the isolated equipment.

.4 Block and shim all bases level so that all ductwork and piping connections can be made to a rigid system at the proper operating level, before isolator adjustment is made. Ensure that there is no physical contact between isolated equipment and the building structure.

.5 Isolate all piping larger than 25 mm (1") diameter directly connected to motorized and/or isolated equipment with 25 mm (1") static deflection spring hangers in accordance with the following schedule:

PIPE DIAMETER	SPRING HANGER OR MOUNT SPACING
TO 100 mm (4")	First 3 Points Of Support
125 mm (5") TO 200 mm (8")	First 4 Points Of Support

.6 The first point of support shall have a static deflection of twice the deflection of the isolated equipment (but maximum 50 mm [2"]).

.7 Arrange and pay for the vibration isolation equipment manufacturer to visit the site to inspect installation of his equipment. Do any revision work required as a result of improper installation. When the vibration isolation equipment manufacturer is satisfied with the installation, obtain from him a letter stating that he has inspected the installation and that his equipment is properly installed. Forward a copy of the letter to the Consultant.

3.19 PIPE LEAKAGE TESTING

.1 After new piping has been placed in position and all branch piping installed, but before the piping has been insulated or concealed, and before equipment, fixtures and fittings have been connected, test all piping in the presence of governing authorities, if required, and the Consultant or his authorized representative.

.2 Drainage & Vent Piping:

.1 Securely close all openings and pipe ends and fill piping with water up to the highest level, and ensure that the water stands at the same level for a minimum of two (2) hours. After the fixtures and fittings are set and the pipes connected to the building drain or drains, turn on water into all pipes, fixtures, fittings and traps in order to detect any imperfect material or workmanship. Make a smoke test if required by the Municipality.

.3 Domestic Water Piping:

.1 Test piping with cold water at a pressure of 1-1/2 times normal working pressure and maintain the pressure for a minimum of 2 hours.

.4 Heating Water and Glycol Solution Piping:

.3 When the entire mechanical plant is ready for acceptance, but before acceptance of same, subject the entire plant to a continuous run for the length of time required for the purpose of demonstrating that all apparatus, materials, and systems are in perfect working order, that all controls and operating services are properly adjusted, that all units are heating and/or cooling properly, and that the systems provide uniform temperatures inside the building regardless of outside temperatures or conditions. Make the tests under the direction of the Consultant, and if the plant is not in proper operating condition, the Owner reserves the right, if all defects are not properly rectified, to employ other parties to make the necessary alterations and put the systems in proper working order, at your expense.

.4 Note that the testing specified above must be complete prior to issue of a Certificate of Substantial Performance.

3.21 INTERRUPTIONS TO AND SHUT-DOWNS OF MECHANICAL SERVICES AND SYSTEMS

.1 Coordinate all shut-downs and interruptions to existing mechanical systems and services with the Consultant and Owner, and perform at times acceptable to the Owner.

.2 Upon award of Contract, submit to the Consultant a list of anticipated shut-down times and their maximum duration.

.3 Prior to each shut-down or interruption, inform the Owner and Consultant in writing five (5) working days in advance of the proposed shut-down or interruption and obtain written approval to proceed. Do not shut-down or interrupt any system or service without such written approval.

.4 Perform work associated with shut-downs and interruptions as continuous operations to minimize the shut-down time and to reinstate the systems as soon as possible, and, prior to any shut-down, ensure that all materials and labour required to complete the work for which the shut-down is required are available at the site.

3.22 CONCRETE WORK FOR MECHANICAL SERVICES

.1 Provide all concrete work, including reinforcing and formwork, required for mechanical work. All concrete shall be minimum 20,700 kPa (3,000 psi) ready-mix concrete provided in accordance with requirements of Division 3, unless otherwise noted.

3.23 PIPING EMBEDDED IN CONCRETE

.1 Where piping is to be embedded within structural concrete, install such piping in compliance with the requirements of the latest edition of CSA Standard CAN3-A23.1, "Concrete Materials and Methods of Concrete Construction," with specific reference to Section 13.5. Generally installation practices and methods shall be confirmed with and accepted by the Structural Engineer.

.2 Where piping is to be embedded within slabs, the following criteria shall also be followed:

.1 Where piping pass by a column, stay at least two times the thickness of the slab and drop away from the column;

.2 Where piping terminate adjacent to a column or wall, bring the piping in toward the column/wall as close as to 90° to the face of the column as possible within two times the thickness of the slab and drop away from the column;

.1 pack openings in non-fire rated interior construction with mineral wool and seal both ends of the opening with non-hardening silicone base caulking compound to produce a water-tight seal.

.2 pack and seal openings in fire rated walls and slabs as specified in this Section in the Article entitled "INSTALLATION OF FIRESTOPPING AND SMOKE SEAL MATERIALS".

.3 pack openings in exterior walls with lead wool or oakum and seal both ends of the opening water-tight with approved non-hardening silicone base caulking compound.

3.27 INSTRUCTIONS TO OWNER

.1 Instruct the Owner's designated representatives in all aspects of the operation and maintenance of systems and equipment specified in succeeding Sections of this Division of the Specification. Obtain in writing from the Consultant a list of the Owner's representatives to receive instructions.

.2 Arrange and pay for the services at the site of qualified technicians and other manufacturer's representatives to instruct on specialized portions of the installation.

.3 Submit to the Consultant prior to application for a Certificate of Substantial Performance, a complete list of systems for which instructions were given, stating for each system:

.1 date instructions were given to the Owner's staff;

.2 duration of instructions;

.3 names of persons instructed;

.4 other parties present (manufacturer's representatives, etc.).

.4 Obtain the signatures of the Owner's staff to verify they properly understood the system installation, operation and maintenance requirements and have received operating and maintenance manuals and record drawings.

3.28 19004INSTALLATION OF IDENTIFICATION NAMEPLATES

.1 For each piece of mechanical equipment, provide nameplates.

.2 Where nameplate cannot be satisfactorily attached with adhesive, provide a nylon tie to attach the nameplate.

3.29 MOTOR STARTER SCHEDULES

.1 Motor Starter Schedules "SS-01" to "SS-06" inclusive are included at the end of this Section of the Specification and forms an integral part of this Section.

END OF SECTION 20 05 15

PART 1 - GENERAL

1.1 REFERENCES

.1 Section 22 05 00 in this Division of the Specification applies to and is a part of this Section of the Specification.

.2 Section 22 05 15 in this Division of the Specification also applies to and is a part of this Section of the Specification. The Section contains requirements, products, and methods of execution that apply to this Section as well as to other Sections of Division 22/23.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

.1 The following work which is related to the plumbing work is specified in other Sections of the Specification:

.1 Provision of underground drainage and water service piping outside the building and to a point 5' (1.5 m) outside building lines;

.2 Mounting and flashing only (in roof areas) of roof drain bodies;

.3 Provision of site applied thermal insulation for plumbing work;

.4 Plumbing fixtures and fittings;

.5 Installation of vent stack roof flashing accessories;

.6 Provision of washroom accessories including grab bars;

.7 Installation of vent stack roof flashing accessories;

1.3 SHOP DRAWINGS

.1 Submit shop drawings for all plumbing materials and equipment specified PART 2 of this Section except drainage piping cleanouts, vacuum breakers, chlorine, and standard shut-off and check valves.

.2 Submit certified performance curves with all pump shop drawings.

PART 2 - PRODUCTS

2.1 VENT PIPING ROOF FLASHING ACCESSORY

.1 Lexsuco Canada Ltd., spun aluminum, vandal-proof, vent stack covers each complete with a hooded sleeve and an insulation sleeve all sized to suit the vent stack.

.2 Acceptable manufacturers are Lexsuco Canada Ltd. and Thaler Metal Industries Ltd.

2.2 DRAINAGE PIPING CLEANOUTS

.1 TY fittings, with extra heavy brass plugs screwed into the fittings.

.2 Smith No. 4500 or equal, enamelled cast iron cleanout tees, each complete with a large access opening and gasketed removable cover with stainless steel hardware.

.3 Bronze or copper cleanout tees each complete with a bronze ferrule.

.2 Singer Valve Co. Ltd., series 106-PR, pilot operated, adjustable, pressure reducing valve as specified on the drawing(s), complete with a bronze globe valve modulated by a diaphragm which in turn is operated by the pilot.

.3 Acceptable manufacturers are Singer Valve Co. Ltd., Braukman Controls Co. Ltd., Watts Industries (Canada) Inc. and Spirax Sarco Canada Ltd.

2.8 WATER PIPING VACUUM BREAKER

.1 Watts Industries (Canada) Inc., No. NF8 vacuum breaker to CAN/CSA-B64.2-94.

.2 Acceptable manufacturers are Watts Industries (Canada) Inc., Hersey Products Inc. and Zurn Industries "Wilkins Division".

PART 3 - EXECUTION

3.1 SUPPLY OF FLASHING ACCESSORIES FOR ROOF VENT STACKS

.1 Supply a vent stack cover accessory for each vent stack penetrating the roof.

.2 Hand the vent stack cover to the roofing trade at the site for installation and flashing into roof construction as part of the roofing work.

.3 Install vent stack piping up through and to a height as per vent stack cover manufacturer's instructions.

3.2 DRAINAGE AND VENT PIPING INSTALLATION REQUIREMENTS

.1 Provide all required drainage and vent piping. Pipe, unless otherwise specified, shall be as follows:

.1 For underground pipe inside the building and to points 5' (1.5 m) outside building lines - Class 4000 cast iron, or rigid PVC sewer pipe, minimum 3" (75 mm) diameter; If PVC piping is used, provide type "BDS" or equal, piping for drainage piping up to 6" (150 mm) in diameter and type "Ultra-Rib" or equal, where drainage piping exceeds 6" (150 mm) diameter. PVC piping is specified in Section 15050;

.2 For pipe inside the building and above ground in sizes larger than 3" (75 mm) diameter - Class 4000 cast iron;

.3 For pipe inside the building and above ground in sizes to and including 3" (75 mm) diameter - type DWV copper;

.4 for drainage pump discharge pipe connections inside the building and above ground, from the pump to the gravity discharge main, including valve connections – Schedule 40 galvanized steel with grooved end galvanized couplings and fittings;

.5 for drainage pumped discharge piping underground inside and/or outside the building, to gravity main – rigid PVC pressure pipe and fittings.

3.3 INSTALLATION OF DRAINS

.1 Provide drains where shown on the drawings.

.2 In Equipment Rooms and similar areas, exactly locate floor drains to suit the layout of mechanical equipment and location of equipment indirect drainage piping.

.3 In finished areas, confirm the exact location and finish of drains with the Consultant prior to roughing-in.

.4 Equip each drain connected to sanitary drainage piping with a trap.

.5 Provide vent piping and cold water supply piping to drains wherever required by Part 7 (Plumbing) of the Ontario Building Code and/or shown on the drawings. Water supply piping from trap seal priming unit to drains shall consist of Type "M" hard copper tubing above ground and Type "L" soft copper underground.

.6 Place roof drains in position for flashing into roof construction as part of the roofing work. When mounting is complete, connect with piping and provide drain accessories.

3.4 DOMESTIC WATER PIPING INSTALLATION REQUIREMENTS

.1 Provide all required domestic water piping in accordance with the requirements of Part 7 (Plumbing) of the OBC. Pipe, unless otherwise noted shall be as follows:

.1 For underground service piping to inside building - cement lined centrifugal ductile iron or where approved by governing authorities, Canron "Blue Brute" rigid PVC;

.2 For service pipe inside the building and above ground from termination of underground main to and including meter connection and bypass and similar service entrance connections - type "K" hard drawn copper.

.3 For all domestic hot water, cold water and tempered water distribution piping inside the building and above ground except as noted above - type "L" hard copper.

.2 At your option, domestic hot, cold and tempered water distribution piping 2 1/2" (65 mm) diameter to and including 6" (150 mm) diameter inside the building and above ground except as noted above may be type “L” grooved end copper pipe, fittings and joints in lieu of solder joined copper piping.

.3 At your option, domestic hot, cold and tempered water distribution piping 1/2" (12 mm) diameter to and including 4" (100 mm) diameter inside the building and above ground except as noted above may be Viega type “L” “ProPress” copper pipe, fittings and joints in lieu of solder joined copper piping.

.4 Brace and secure underground water service pipe at bends and tees with concrete thrust blocks in accordance with Municipal Standards.

.5 Slope all piping so that it can be completely drained.

.6 Provide an accessible manually operated air vent above the high point of each water piping system unless the systems are suitably vented through frequently used plumbing fixtures or outlets.

.7 Provide a vacuum breaker in piping connecting a hose bibb provided integral with the hose bibb or similar fitting. Install in accordance with CAN/CSA-B64.10-94.

.3 Valved domestic cold water piping connection with vacuum breaker and hose connection for glycol solution make-up.

END OF SECTION 22 13 16

PART 1 - GENERAL

1.1 REFERENCES

.1 Section 22 05 00 applies to and is an integral part of this Section of the Specification.

.2 Section 22 05 150 in this Division of the Specification also applies to and is a part of this Specification. The Section contains requirements, products and methods of execution that apply to this Section as well as to other Sections of Division 22.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

.1 The following work which is related to the plumbing fixture and fitting work is specified in other Sections of the Specification:

.1 Provision of counters and cutting or drilling counters to accept plumbing fixtures and trim;

.2 Provision of washroom accessories including soap dispensers and grab bars;

.3 Provision of sealant for fixtures;

.4 Provision of power wiring, back boxes for "No-Touch" fixture trim.

1.3 SHOP DRAWINGS

.1 Submit shop drawings (fixture cuts) for all plumbing fixtures and fittings.

PART 2 - PRODUCTS

2.1 REFER TO DRAWINGS FOR PLUMBING FIXTURE SCHEDULE

ACCEPTABLE PLUMBING FIXTURE AND FITTING MANUFACTURERS

.1 Acceptable manufacturers of plumbing fixtures and fittings are as follows:

.1 Vitreous china, enamelled steel and enamelled cast iron fixtures, unless otherwise noted American Standard, Zurn, and Crane;

.2 Stainless steel sinks – Kindred Commercial Ltd., and Architectural Metal Products

.3 Water closet seats - Centoco, Moldex, Olsonite, and Beneke;

.4 Flush valves – Sloan, Delta Commercial, Zurn;

.5 Fixture carriers - J. R. Smith, Watts Industries and Zurn Industries;

.6 Supply fittings, unless otherwise noted - Chicago Faucets, Delta Commercial, Zurn Industries, Sloan, Speakman and American Standard;

.7 Drain fittings, angle supplies and traps unless otherwise noted McGuire, Zurn Industries, Delta Commercial, Chicago Faucets and American Standard;

.8 Prefabricated mop sinks - Stern Williams and Fiat;

.9 Emergency eye washes - Haws, Guardian, Bradley, and Speakman;

.10 Mechanical and thermostatic mixing valves – Haws, Symmons, Powers, Leonard and RADA.

.11 Where a mixing valve is specified (i.e., lavatory or sink), pipe outlet of valve to supply fitting hot water inlet, unless shown or specified otherwise.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Section 22 05 00 in Division 15 applies to and is a part of this Section of the Specification.

.2 Section 22 05 15 in this Division of the Specification also applies to and is a part of this Section of the Specification. The Section contains requirements, products, and methods of execution that apply to this Section as well as to other Sections of Division 22/23.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

.1 The following work which is related to the air handling work is specified in other Sections of the Specification:

.1 all required starter interlock wiring and 115 volt control wiring;

.2 supply of control components and control connections to all components such as motorized dampers associated with automatic control systems;

.3 installation of curbs for roof mounted fans;

.4 provision of exterior wall louvres and birdscreen;

.5 provision of domestic water and drain piping connections to equipment;

.6 provision of casings, plenums, ductwork, dampers, grilles, diffusers, and similar system components;

.7 provision of heat transfer piping connections to coils;

.8 provision of site applied thermal insulation;

.9 provision of products-of-combustion detectors in fan equipment for fire alarm system fan shut-down;

.10 provision of controls for heat pipes and heat wheels excluding heat pipe actuator which shall be provided by unit manufacturer;

.11 provision of variable frequency drives;

.12 provision of outdoor air and exhaust air dampers and actuators.

1.3 SHOP DRAWINGS

.1 Submit shop drawings for all equipment specified in this Section.

.2 Shop drawings shall be complete with outline drawings, AMCA certified pressure volume performance curves, showing point of operation and AMCA Certified sound power data shall be submitted.

.3 Include the name of the fan manufacturer in the submission for cabinet fan assemblies.

PART 2 - PRODUCTS

2.1 ROOFTOP UNITS

.1 General

.7 Unit shall have a factory-installed internally sloped condensate drain pan, providing a minimum ¾-in.-14 NPT connection to prevent standing water from accumulating. Pan shall be fabricated of high impact polycarbonate material and shall slide out for cleaning and or maintenance on 03-16 sizes. An alternate vertical drain (3/4-in. NPT) connection is also available. Pan shall be fabricated of epoxy powder coated steel for other sizes. All drain pans conform to ASHRAE 62 self-draining provisions.

.8 Unit shall have standard thru-the-bottom power and control wiring connection capability.

.3 Fans

.1 Indoor blower (evaporator fan):

.2 Centrifugal supply air blower shall have rubber-isolated, cartridge type ball bearings (03-16) or pillow-block ball bearings (20-28) and adjustable belt drive.

.3 Fan wheel shall be made from steel with a corrosion resistant finish. It shall be a dynamically balanced, double-inlet type with forward-curved blades.

.4 The indoor fan system (blower wheels, motors, belts, and both bearings) shall slide out for easy access.

.5 Evaporator-fan motors shall be continuous operation, open drip-proof. Bearings shall be sealed, permanently lubricated ball-bearing type for longer life and lower maintenance.

.6 Fan belt shall be located on opposite side of evaporator coil to prevent damage from broken fan belts.

.7 Condenser fans shall be of the direct-driven propeller type, with corrosion-resistant aluminum blades riveted to corrosion-resistant steel supports. They shall be dynamically balanced and discharge air upwards. Condenser-fan motors shall be totally enclosed, thermally protected, and be of a shaft down design to protect from direct contact from harsh environments.

.8 Induced-draft blower shall be of the direct-driven, single inlet, forward-curved, centrifugal type. It shall be made from aluminized steel with a corrosion-resistant finish and shall be dynamically balanced.

.4 Compressor(s):

.1 Fully hermetic, scroll type with on demand crankcase heaters, internal high-pressure and temperature protection.

.2 Factory mounted on rubber grommets and internally spring mounted for vibration isolation.

.3 Be mounted on dedicated mounting plate to ensure secure design and reduced sound levels.

.5 Direct Expansion Coils

.1 Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.

.2 Solid core refrigerant filter driers with pressure ports.

.3 Refrigerant pressure gage ports and connections on suction, discharge, and liquid lines.

.9 Field Installed DDC Controls By Others

.1 The Unit shall be controlled by Building Automation System. Controls shall be field provided and field installed by others.

.10 Roof Curb

.1 Each unit shall be provided with a prefabricated l2-gauge galvanized steel mounting curb designed and manufactured by the unit manufacturer for field assembly on the roof decking prior to unit shipment. The roof curb shall be a perimeter type with complete perimeter support of the air handling section and rail support of the condensing unit section. The curb shall be a minimum of 600 mm (24 inches) high or as specified on the drawings. The roof curb shall be approved by the National Roofing Contractors Association.

.11 Acceptable manufacturers are Carrier, Lennox and York.

2.2 AIR FILTERS

.1 Camfill-Farr, air filters as per the drawing schedule. All filters shall be ULC listed and labelled and rated as Class I or Class II.

.2 Pre-filter shall have a 20-25% average efficiency when tested by the ASHRAE 52.1-92 test method. The frame shall be constructed of high strength moisture resistant "beverage" board. Two mating die-cut boxes are bonded together to form a double wall construction. The media pad support retainers shall be bonded to the media on both the air entering and leaving sides.

.3 Main filter shall have a 80-85% average efficiency when tested by the ASHRAE 52.1-92 test method. Filter media shall be of microfine glass laminated to a reinforcing backing to form a uniform lofted media blanket. Media blanket shall be formed into uniform tapered radial pleates and bonded to a stiffened backing bonded to the downstream side of the media to prevent media vibration. The media shall be mechanically and chemically bonded to the inside periphery of the enclosing frame to prevent air bypass. The enclosing frame shall be constructed of an alloy of zinc, aluminium and steel. Media support stabilizers shall be mechanically fastened to diagonal support members of the same construction to create a rigid and durable enclosure.

.4 Acceptable manufacturers are Farr, AFF-Canada and Airguard Industries.

2.3 AIR FILTER GAUGES

.1 Dwyer Industries Inc. Series 2000 differential pressure gauge with a 0-500 Pa range, accurate to within 2% of full scale and complete with all required mounting and connection accessories. The 120 mm diameter dial shall have a zero (0) point adjustment and graduations in inches of wc.

PART 3 - EXECUTION

3.1 INSTALLATION OF ROOFTOP UNITS

.1 Provide rooftop units where shown on the drawings;

.2 Install rooftop units in wide roof curbs.

LIST OF CONTENTS

PART 1 - GENERAL

1.1 REFERENCES
1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS
1.3 SHOP DRAWINGS

PART 2 - PRODUCTS

2.1 GALVANIZED STEEL DUCTWORK
2.2 DUCT SEALER
2.3 FLEXIBLE CONNECTION MATERIAL
2.4 FUSIBLE LINK FIRE DAMPERS
2.5 ROUND TO RECTANGULAR DUCT CONNECTIONS
2.6 AIR TURNING VANES
2.7 VOLUME (BALANCING) DAMPERS
2.8 BACKDRAFT DAMPERS
2.9 MOTORIZED DAMPERS
2.10 WALL BOXES
2.11 DUCT ACCESS DOORS
2.12 CASING AND PLENUM MATERIAL
2.13 CASING AND PLENUM ACCESS DOORS
2.14 PLENUM AND CASING BAFFLES
2.15 INSTRUMENT TEST PORTS
2.16 ACOUSTIC LINING
2.17 GRILLES AND DIFFUSERS

PART 3 - EXECUTION

3.1 GENERAL RE: FABRICATION AND INSTALLATION OF DUCTWORK
3.2 FABRICATION AND INSTALLATION OF GALVANIZED STEEL DUCTWORK
3.3 INSTALLATION OF FLEXIBLE CONNECTION MATERIAL
3.4 INSTALLATION OF SPLITTER DAMPERS
3.5 INSTALLATION OF TURNING VANES
3.6 INSTALLATION OF FUSIBLE LINK FIRE DAMPERS
3.7 INSTALLATION OF BACKDRAFT DAMPERS
3.8 INSTALLATION OF MOTORIZED DAMPERS
3.9 INSTALLATION OF WALL BOXES
3.10 INSTALLATION OF VOLUME (BALANCING) DAMPERS
3.11 INSTALLATION OF DUCT ACCESS DOORS
3.12 FABRICATION AND INSTALLATION OF CASINGS AND PLENUMS
3.13 INSTALLATION OF CASING AND PLENUM BAFFLES
3.14 INSTALLATION OF INSTRUMENT TEST PORTS
3.15 INSTALLATION OF ACOUSTIC LINING
3.16 INSTALLATION OF GRILLES AND DIFFUSERS
3.17 TESTING, ADJUSTING AND BALANCING

.2 Alpha Industries Limited, "Free-Flow," round (spiral) ductwork shall be prime lock forming quality, galvanized sheet steel to ASTM A653/653M, satin coated finish on ductwork to be painted, G60 coating on all other ductwork, spiral lockseam, factory fabricated fittings with fully welded seams and joints, with metal gauges in accordance with published SMACNA HVAC Duct Construction Standards Metal and Flexible, to suit the duct configuration and classification.

.1 acceptable manufacturers are Alpha Industries Limited, Flexmaster Ltd., Don-Park, Ecco Manufacturing and United McGill Corp.

.3 Ductmate Canada Limited, "DUCTMATE," "SpiralMate," gasketed, sealed, flanged joint system components are acceptable in rectangular galvanized steel duct construction:

.1 acceptable manufacturers are Ductmate Canada Limited and Nexus PDQ.

2.2 DUCT SEALER

.1 Hardcast Inc. (Alpha Industries Ltd.), "Iron-Grip," UL Listed, Class 1 (not exceeding ratings of: flame spread 5; smoke developed 0; fuel contributed 0), water based duct sealer, to ANSI/NFPA 90A -1993, non-flammable wet or dry and flexible when cured.

.2 Acceptable manufacturers are Alpha Industries Ltd., Flexmaster Canada Ltd., Dyn Air, Ductmate Canada Limited and Duro-Dyne.

2.3 FLEXIBLE CONNECTION MATERIAL

.1 Duro-Dyne Ltd., "DUROLON," UL listed to NFPA 90A, fire resistive, weatherproof flexible vibration isolation fabric material unaffected by sunlight and Ozone, consisting of DuPont "Hypalon" coated woven fibreglass fabric 814 g/sq.m (24 oz/yd.2) mass, 0.63 mm (0.015") thick, suitable for -40°C to 12-°C (-40°F to 250°F).

.2 Acceptable products are Duro Dyne of Canada Ltd. as above, Ventfabrics Canada Ltd. and Elgen Engineering Ltd.

2.4 FUSIBLE LINK FIRE DAMPERS

.1 Nailor Industries Inc., ULC 1 1/2 hour rated, listed and labelled galvanized steel folding blade fire dampers as follows:

.1 Model No. 0120, Type B, in rectangular ductwork less than 355 mm minimum dimension;

.2 Model No. 0110, Type A, in rectangular ductwork 355 mm and larger minimum dimension;

.3 Model No. 0130, Type C, in round ductwork.

.2 Each fire damper shall be complete with a replaceable 74°C fusible link, and a suitable galvanized steel sleeve.

.3 Horizontally mounted fire dampers shall be complete with stainless steel closure springs and positive blade locking devices, and a pull tab arrangement to permit resetting with access from either side of the damper.

.4 Fusible link fire dampers required in 3 and 4 hour rated construction shall be generally as specified above but 0500 Series ULC 3 hour rated and labelled.

.5 Acceptable manufacturers are Nailor Industries Inc., Ruskin Ltd., Greenheck Fan Corp., United Sheet Metal, and NCA Manufacturing Limited.

.4 out-of-airstream linkages and crank arms constructed of aluminium and corrosion resistant, zinc & nickel plated steel, complete with cup-point trunnion screws.

.2 Dampers shall be sized for "flanged" installation (damper blade area to be equal to duct or plenum cross section area).

.3 Acceptable damper manufacturer are Tamco and Nailor.

.2 Control Damper Applications:

.1 Automatic control dampers shall be opposed blade type for mixing and parallel blade type for "On off" service.

.2 Maximum damper blade length shall be 1.2 m (4'). Maximum permissible leakage shall not exceed I% of the total flow based on an approach velocity of 1500 FPM (7.62 m/s) over a temperature range of from 33°C (30°F) to 38°C (100°F) and a pressure of 3" wg (0.75 kPa). Unless otherwise noted, blades shall be constructed of formed galvanized steel with neoprene seal edges, continuous stops and seals on all sides, oil impregnated bronze bearings, and galvanized steel channel frames.

.3 Centre bar linkage connectors shall be used wherever possible but where centre bar linkages cannot be used due to space limitations, external side linkage connectors may be used.

.4 Control dampers in aluminum ductwork or casings shall be as above but constructed of type 316 stainless steel and completely corrosion resistant.

.5 Acceptable damper manufacturers are Ruskin, National Controlled Air, Nailor Industries and TAMCO.

2.10 WALL BOXES

.1 Reversomatic Manufacturing Ltd. single or multiple compartment "Weather-Tight Wall Boxes" with steel housing with single coat epoxy painted interior and double epoxy painted interior, 150 dia. inlets, a backdraft damper per compartment/section and complete with a single, horizontal blade type extruded aluminium grille with clear anodized finish.

.2 Acceptable manufacturers are Reversomatic Manufacturing Ltd., Zonex (Airex), Greenheck Fan Corp., Loren Cook, JennFan, Carnes and Penn Ventilator."

2.11 DUCT ACCESS DOORS

.1 In accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible with sizes suitable in all respects for the purpose for which they are provided, and, unless otherwise specified, constructed of the same material as the duct they are associated with.

2.12 CASING AND PLENUM MATERIAL

.1 Galvanized (G90) sheet steel with metal gauges in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible, to suit the pressure construction standard of the system.

2.13 CASING AND PLENUM ACCESS DOORS

.1 Gasketed access doors, factory insulated type in insulated casings or plenums, each constructed of galvanized steel (unless otherwise specified) in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible, to suit the pressure classification of the casing or plenum.

.2 Access doors shall be minimum 915 mm x 450 mm (36" x 18") but generally 1450 mm x 450 mm (48" x 18") unless casing or plenum panel sizes do not permit, in which case the access doors shall be as large as possible.

.3 Where access doors occur in casings and/or plenums constructed of materials other than galvanized steel, the doors shall be as above but constructed of material to match the casing and plenum material.

.4 Provide automatic control dampers, except for dampers supplied as part of the cabinet fan assemblies.

.5 Ensure that control dampers located in aluminium ductwork are constructed of type 316 stainless steel and are non-corrosive.

.6 Where watertight horizontal ductwork is required inside the building, construct the ducts without bottom longitudinal seams. Solder or weld the joints of bottom and side sheets. Seal all other joints with duct sealer. Slope horizontal duct to hoods, risers, or drain points. Provide watertight ductwork for:

.1 outdoor air intakes;

.2 wherever else shown.

3.2 FABRICATION AND INSTALLATION OF GALVANIZED STEEL DUCTWORK

.1 Provide all required galvanized steel ductwork. Unless otherwise noted, construct all ductwork of galvanized sheet steel, round, oval, or rectangular as shown and/or required.

.2 Round or oval ductwork and fittings shall be factory made and joints shall be slip type secured with properly sized sheet metal screws.

.3 Factory made flanged joint system components are acceptable in rectangular duct installations. Install the components in strict accordance with the manufacturer's printed instructions and recommendations.

.4 Seal ductwork using duct sealer reinforced with embedded tape where required, in accordance with sealant manufacturer's instructions and requirements of SMACNA "HVAC AIR DUCT LEAKAGE TEST MANUAL."

3.3 INSTALLATION OF FLEXIBLE CONNECTION MATERIAL

.1 Provide a minimum of 150 mm (6") of flexible connection material where ducts, plenums and/or casings connect to fans, and wherever else indicated.

.2 Install flexible connection material in accordance with requirements of SMACNA HVAC Duct Construction Standards Metal and Flexible.

3.4 INSTALLATION OF SPLITTER DAMPERS

.1 Provide splitter dampers in supply ductwork at branch duct connections to supply air mains, and wherever else shown and/or specified on the drawings, or required for proper air distribution and air quantity balancing. Install splitter dampers such that they cannot vibrate and rattle and such that the damper operation mechanisms are in an easily operable location.

3.5 INSTALLATION OF TURNING VANES

.1 Provide turning vanes in ductwork elbows where shown on the drawings and wherever else required where, due to site installation routing and duct elbow radius, turning vanes are recommended in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible.

.2 Provide volume extractor type turning vanes in short branch supply duct connections off mains to grilles and diffusers where shown and/or specified.

3.6 INSTALLATION OF FUSIBLE LINK FIRE DAMPERS

.1 Provide fusible link fire dampers where shown on the drawings. Ensure that each fire damper is suitable for the fire rating of the fire barrier it is associated with.

.2 Supply dampers which are factory secured within a galvanized steel sleeve, or supply the sleeves and install at the site. Install the dampers by means of No. 14 gauge, 20 mm (3/4") sheet metal screws at 6" (150 mm) OC.

.4 Confirm exact volume damper locations with personnel doing air quality balancing and testing work and install dampers to suit.

3.11 INSTALLATION OF DUCT ACCESS DOORS

.1 Provide access doors in ductwork for access to all duct system components which will or may need maintenance and/or repair, including booster heating coils. Install in accordance with requirements of SMACNA HVAC Duct Construction Standards Metal and Flexible.

.2 Identify access doors provided for fusible link damper maintenance with "FLD" painted or marker type red lettering and ensure that the doors are properly located for damper maintenance.

.3 When requested, submit a sample of proposed duct access doors for approval.

.4 Where sectionalized fusible link dampers are provided in large ducts, provide multiple access doors to suit and adequately reinforce the ductwork to suit the number of access doors installed.

3.12 FABRICATION AND INSTALLATION OF CASINGS AND PLENUMS

.1 Provide all required casings and plenums. Construct casings and plenums of the same material as the connecting duct system, unless otherwise noted.

.2 All sheet metal work, whether workshop or site fabricated, for housing fans and equipment and all air passage barriers connected to building surfaces shall be considered casings and/or plenums.

.3 Construct and install casings and plenums in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible to suit the systems static pressure and velocity. Ensure that plenums and casings secured to building structure are gasketted air-tight and equipped with angle iron reinforcing.

.4 Provide all required access doors in casings and plenums. Access doors shall be constructed of the same materials as the casing or plenum. Install in accordance with requirements of SMACNA HVAC Duct Construction Standards Metal and Flexible.

3.13 INSTALLATION OF CASING AND PLENUM BAFFLES

.1 Provide reinforced baffles in casings and plenums wherever required to prevent stratification or other air movement or mixing problems.

.2 Construct baffles of the same material as the casing or plenum.

.3 Exactly locate and arrange baffles as per directions of personnel performing system testing and balancing work.

3.14 INSTALLATION OF INSTRUMENT TEST PORTS

.1 Provide instrument test ports in all main ducts at connections to fans, plenums or casings, in all larger branch duct connections to mains, and wherever else required for proper air quantity balancing and testing of the systems.

.2 Locate test ports where recommended by personnel performing air quantity testing and balancing work.

3.15 INSTALLATION OF ACOUSTIC LINING

.1 Provide acoustic lining to the extent shown and/or specified on the drawings.

.2 Install lining in accordance with requirements of SMACNA HVAC Duct Construction Standards Metal and Flexible.

LIST OF CONTENTS

PART 1 - GENERAL

1.1 REFERENCES
1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS
1.3 QUALITY ASSURANCE
1.4 SUBMITTALS

PART 2 - PRODUCTS

2.1 NIL

PART 3 - EXECUTION

3.1 SITE VISITS DURING CONSTRUCTION
3.2 TESTING, ADJUSTING AND BALANCING WORK
3.3 TESTING, ADJUSTING AND BALANCING REPORT
3.4 VERIFICATION OF TESTING, ADJUSTING AND BALANCING REPORT
3.5 WARRANTY
3.6 SITE VISITS AFTER COMPLETION OF TESTING AND BALANCING

3.2 TESTING, ADJUSTING AND BALANCING WORK

.1 Testing, adjusting and balancing work, as specified herein, shall be performed for the following:

- .1 hot water heating system(s);
- .2 domestic hot water circulation system(s);
- .3 new supply, return and exhaust air handling systems.

.2 Test, adjust and balance the complete mechanical systems over the entire operating range of each system in accordance with the most stringent requirements of the AABC National Standards for Total System Balance or NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems, as applicable, in order to obtain optimum systems performance.

.3 Do not begin testing, adjusting and balancing work until:

- .1 building construction work is substantially complete;
- .2 mechanical systems are complete in all respects, and have been checked, started, adjusted, and then performance tested in the presence of and to the satisfaction of the Consultant;
- .3 the mechanical systems have been prepared for testing and balancing work, as specified in Sections 23 21 16 and 23 05 15.

.4 All mechanical systems to be tested, adjusted and balanced must be maintained in full, normal operation during each day of testing, adjusting and balancing.

.5 Balance all systems with due regard to objectionable noise which shall be a factor when adjusting fan speeds and performing terminal work such as adjusting grille and diffuser air quantities. Should objectionable noise occur at design conditions, immediately report the problem to the Consultant and submit data, including sound readings, to permit the Consultant to make an accurate assessment of the noise problem.

.6 Check all air handling system mixing plenums for stratification, and where the variation of mixed air temperature across coils is found to be in excess of plus or minus 5% of design requirements, report to the Consultant and issue a detail sketch of plenum baffle(s) required to eliminate the stratification. Provide the baffles in accordance with the reviewed sketches.

.7 Perform testing, adjusting and balancing to within plus or minus 5% of design values, and make and record measurements using instruments with minimum accuracy of within plus or minus 2% of required values.

.8 Wherever possible, lock all balancing devices in place at the proper setting, and permanently mark settings on all devices.

.9 Leak test ductwork in accordance with the requirements of SMACNA "HVAC Air Duct Leak Test Manual." Coordinate your work with the work of Section 15880. Provide detailed sketch(es) identifying ductwork not in accordance with acceptable leakage values specified in Section 15880. Forward sketches to Sheet Metal Contractor, on-site, with copies to the Consultant. Retest corrected ductwork.

.1 coil;

.2 heat exchanger (primary and secondary sides);

.3 boiler

.4 circulating pump;

.5 pressure reducing valve;

.6 make-up water;

.7 other auxiliary equipment;

.13 heat transfer system location of system measurements at the supply and return of each primary and secondary loop of each system;

.14 domestic hot water recirc. system location of equipment measurement for the inlet and outlet of each tank, heater and pump, and location of system measurements at each piping main, branch main, branch and sub-branch.

.2 Include for each system to be tested, adjusted and balanced, a neatly drawn, identified (system designation, plant equipment location, and area served) schematic "As-built" diagram indicating all equipment and accessories.

.3 Include report sheets indicating building comfort test readings for all rooms.

.4 Prepare report sheets using the units of measurement (SI or Imperial) as used on the project construction documents.

3.4 VERIFICATION OF TESTING, ADJUSTING AND BALANCING REPORT

.1 When the testing, adjusting and balancing report has been received, the Consultant will schedule a site visit or visits for the purpose of verifying balancing results contained in the report. In addition to spot checking equipment performance, a maximum of 30% of all terminal equipment will be checked.

.2 The testing and balancing agency shall accompany the Consultant during report verification, and shall supply all required tools and instruments to take measurements. Instruments used shall be the same instruments used in performing the testing and balancing work.

.3 If, during the verification procedures, testing and balancing results indicated in the report are found to differ substantially with the results of spot checks, the report will be rejected by the Consultant, and testing, adjusting and balancing procedures shall be repeated and a new report issued for review and verification.

.4 Testing, adjusting and balancing must be complete and accepted by the Consultant prior to application for a Certificate of Substantial Performance of the Work.

.5 Include a copy of the accepted testing and balancing report in each copy of the operating and maintenance instruction manuals.

LIST OF CONTENTS

PART 1 - GENERAL

1.1 REFERENCES
1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS
1.3 SAMPLES
1.4 VAPOUR BARRIER JACKET

PART 2 - PRODUCTS

2.1 FIRE HAZARD RATINGS
2.2 THERMAL PERFORMANCE
2.3 PIPE INSULATION MATERIALS
2.4 EQUIPMENT INSULATION MATERIALS
2.5 DUCTWORK SYSTEM INSULATION MATERIALS
2.6 INSULATION FINISH MATERIALS
2.7 LAGGING ADHESIVE
2.8 INSULATION CEMENTS
2.9 INSULATION ADHESIVES
2.10 INSULATION ACCESSORIES
2.11 ACCEPTABLE INSULATION MANUFACTURERS

PART 3 - EXECUTION

3.1 GENERAL INSULATION APPLICATION REQUIREMENTS
3.2 PIPE INSULATION REQUIREMENTS - FIBREGLASS
3.3 PIPE INSULATION REQUIREMENTS - FIRE RATED INSULATION
3.4 PIPE INSULATION REQUIREMENTS FLEXIBLE ELASTOMERIC
3.5 EQUIPMENT INSULATION REQUIREMENTS
3.6 DUCTWORK SYSTEM INSULATION REQUIREMENTS - FIBREGLASS
3.7 DUCTWORK SYSTEM INSULATION REQUIREMENTS- FLEXIBLE ELASTOMERIC
3.8 INSULATION FINISH REQUIREMENTS

2.2 THERMAL PERFORMANCE

.1 Unless otherwise noted, thermal performance (i.e. conductivity) of insulation shall meet or exceed the values given in Table 6.8.2.A, 6.8.2.B and 6.8.3 of the ASHRAE/IES Standard 90.1-2010.

2.3 PIPE INSULATION MATERIALS

.1 Johns-Manville, "MICRO-LOK" rigid, moulded, sectional glass fibre pipe insulation with a factory applied "AP-T" vapour barrier jacket.

.2 Johns-Manville, "MICROLITE" flexible blanket type glass fibre insulation.

.3 Owens Corning, No. MP-105, factory formed glass fibre insulation for pipe fittings, valves, and similar items.

.4 Pittsburg Corning Corporation "FOAMGLAS," rigid, moulded sectional cellular glass pipe insulation.

.5 Armstrong World Industries Canada Ltd., "AP Armaflex" flexible, elastomeric, 25/50 rated closed cell fire-retardent pipe insulation.

.6 Instant Firestop Inc., "PI" or equal, non-combustible, fire-rated, sectional longitudinally split pipe insulation with a reinforced vapour barrier jacket, ULC listed and labelled as a component in a firestop system assembly.

2.4 EQUIPMENT INSULATION MATERIALS

.1 Johns-Manville, "Pipe and Tank" flexible, fibreglass blanket, insulation bonded to a non-woven fibreglass mat backing.

.2 Johns-Manville "Pipe and Tank - AP" flexible, fibreglass blanket type insulation bonded to a type "AP" vapour barrier backing.

.3 Armstrong World Industries Canada Ltd., "WPARMAFLEX" flexible, elastomeric, 2550 rated closed-cell fire retardant sheet insulation.

2.5 DUCTWORK SYSTEM INSULATION MATERIALS

.1 Johns-Manville, "800 Series Spin Glass - FSK," rigid fibreglass insulation with a factory applied, glass fibre reinforced, foil and flame retardant kraft paper vapour barrier facing.

.2 Johns-Manville, "Microlite – FSK" flexible, blanket type fibreglass insulation with a factory applied, glass fibre reinforced, foil and flame retardant kraft paper vapour barrier facing.

.3 Armstrong World Industries Canada Ltd., "AP Armaflex" flexible elastomeric 25/50 rated closed cell fire retardant sheet insulation.

2.6 INSULATION FINISH MATERIALS

.1 S. Fattal Canvas Inc., ULC listed and labelled "Thermocanvas," with an ASTM flame spread rating of less than 25 and a smoke developed rating of less than 50.

.2 Childers Products Company, "Rolled Jacketing" embossed or smooth, 0.40 mm (.016") thick, aluminum insulation jacket selected internal vapour barrier to suit application and matching prefabricated fitting covers.

.3 flexible elastomeric insulation – Armstrong World Industries Canada Ltd. and Rubatex;

.4 canvas jacketing material - S. Fattal Canvas Inc. and Robson Thermal Mfg. Ltd;

.5 aluminum jacketing material - Childers Product Company and Permaclad Products;

.6 PVC fitting covers and jacketing material – The Sure-Fit System.

PART 3 - EXECUTION

3.1 GENERAL INSULATION APPLICATION REQUIREMENTS

.1 Unless otherwise noted, do not insulate the following:

.1 factory insulated equipment and piping;

.2 heating piping within radiation unit enclosures, including blank filler sections of enclosures;

.3 branch domestic water piping located under counters to serve counter mounted plumbing fixtures and fittings;

.4 exposed chrome plated domestic water angle supplies from concealed piping to plumbing fixtures and fittings;

.5 heated liquid system pump casings;

.6 expansion tanks;

.7 condenser water supply and return piping inside the building;

.8 manufactured expansion joints and flexible connections;

.9 acoustically lined ductwork and/or equipment;

.10 flexible ductwork.

.2 Install insulation directly over pipes and not over hangers and supports.

.3 Do not apply insulation until leakage tests have been satisfactorily completed.

.4 Ensure that all surfaces to be insulated are clean and dry.

.5 No material including tapes, adhesives, etc. used as part of an insulation assembly shall be rated greater than 25/50 Article 2.1 entitled "FIRE HAZARD RATING OF INSULATION" shall be used within a "plenum" as defined in OBC.

.6 Install work generally in accordance with TIAC "NATIONAL INSULATION STANDARDS MANUAL" except conform with manufacturer's published instructions and recommendations and the requirements specified herein this Section of the Specification.

.7 Ensure that the ambient temperature is minimum 13°C (55°F) for at least one (1) day prior to the application of insulation, and for the duration of insulation work.

.8 Where piping and/or equipment is traced with electric heating cable, ensure that the cable has been tested and approved prior to the application of insulation and ensure that the cable is not damaged or displaced during the application of insulation.

.10 hot water heating piping, supply and return, larger than 100 mm (4") diameter - 50 mm (2") thick;

.11 all sanitary and storm drainage piping, domestic water, heating water, chilled water, condenser water, fire protection system piping located in unheated areas and indicated on the drawings to be traced with electric heating cable – 50 mm (2") thick;

.12 boiler feedwater piping complete – 2" (50 mm) thick;

.13 boiler blowdown piping complete – 2" (50 mm) thick;

.2 Provide cellular glass pipe insulation extended a minimum of 50 mm (2") beyond ends of insulation shield at all hanger and support locations for piping 50 mm (2") diameter and larger and not equipped with pipe saddles. Where pipe insulation is covered by a vapour barrier jacket, wrap the cellular glass insulation with same vapour barrier jacket material overlapped a minimum of 25 mm (1") on to the adjacent pipe insulation's jacket.

.3 Secure overlap flap of the jacketed insulation in place with a full coverage of adhesive. Firmly butt together sections of the insulation and cover the butt joints with 75 mm (3") wide factory supplied strips of the vapour barrier jacket material secured in place with adhesive.

.4 Pre-formed glass fibre fitting insulation should be used at pipe fittings, valves, etc. Cover fitting insulation with the same sectional pipe insulation jacket material laminated in place with adhesive.

3.3 PIPE INSULATION REQUIREMENTS - FIRE RATED INSULATION

.1 Where pipe which is to be insulated as specified above penetrates fire rated walls and slabs, provide fire rated, ULC listed, non-combustible sectional insulation on the portion of pipe in the fire barrier and for a distance of 50 mm (2") on either side of the fire barrier. Insulation thickness shall be as specified, but in any case minimum 25 mm (1").

3.4 PIPE INSULATION REQUIREMENTS FLEXIBLE ELASTOMERIC

.1 Except where types of insulation are specified for portion of piping in succeeding articles in this section. Insulate the following pipe with closed cell flexible elastomeric type insulation of the thickness noted:

.1 refrigerant piping inside the building – 12 mm (1/2") thick;

.2 refrigerant piping outside the building – 20 mm (3/4") thick.

.2 Install flexible elastomeric pipe insulation in strict accordance with the manufacturer's published instructions and recommendations.

.3 Cover exposed elastomeric pipe insulation with adhesive supplied by the insulation manufacturer.

3.5 EQUIPMENT INSULATION REQUIREMENTS

.1 Insulate the following equipment with fibreglass blanket type insulation with vapour barrier backing of the thickness noted:

.1 roof drain bodies where inside the building - 38 mm (1-1/2") thick;

.2 domestic cold water pump casings – 38 mm (1-1/2") thick.

.6 Provide dry wall type metal corner beads on edges of exposed rectangular ductwork, casings and plenums in equipment rooms, service corridors and any other area where the insulation is subject to accidental damage.

3.7 DUCTWORK SYSTEM INSULATION REQUIREMENTS- FLEXIBLE ELASTOMERIC

.1 Insulate all exposed ductwork and associated plenums or casings outside the building with 1" (25 mm) thick closed cell flexible elastomeric sheet insulation applied in two (2) ½" (12 mm) thick layers with staggered joints.

.2 Install flexible elastomeric sheet insulation in strict accordance with the manufacturer's published instructions and recommendations to produce a weatherproof installation. Seal sheet metal work joints watertight with duct sealer prior to applying insulation.

3.8 INSULATION FINISH REQUIREMENTS

.1 Except as otherwise specified, jacket all exposed fibreglass insulation work inside the building with canvas secured with a full 100% covering coat of lagging adhesive. Neatly trim all canvas joints and shrink the canvas tight in place.

.2 At your option, exposed fibreglass insulation inside the building may be jacketed with PVC fitting and jacketing installed and sealed in accordance with the manufacturer's instructions to produce a watertight finish. Do not mix finishing methods in order to maintain uniformity of finish.

.3 Cover exposed elastomeric insulation with glass mesh fully, and tightly secured to the insulation with adhesive supplied by the insulation manufacturer. Neatly trim glass mesh.

.4 Protect insulation on exposed piping and ductwork penetrating mechanical room floors with sheet steel or aluminum jacketing for a distance of 1 m (3') above the floor level.

.5 Jacket all insulation outside the building with aluminum jacketing with prefabricated fitting covers. Install in accordance with manufacturer's published instructions. Confirm vapour barrier requirements prior to ordering.

.6 Seal all fibreglass insulation outside the building with canvas jacket lagged in place with waterproof adhesive (coating), then apply two (2), heavy, 100% covering coats of weather-proof lagging coating and apply two (2) coats of coloured weatherproof decorative finish. Confirm finish colour prior to ordering. Alternatively, jacket the pipe insulation with an aluminum jacket with internal vapour barrier secured in place with aluminum bands on 18" (450 mm) centres and with 2" (50 mm) overlap (or as otherwise stated in manufacturer's published instructions) at butt joints and longitudinal seams to produce a completely weatherproof and water-tight installation.

.7 Unless otherwise specified, finish all exposed flexible elastomeric insulation work with two (2) coats of finish supplied by the insulation manufacturer. Apply the finish in accordance with the manufacturer's recommendations and instructions. Confirm finish colour requirement(s) and tint finish in accordance with manufacturer's direction to Consultant's colour scheme.

END OF SECTION 23 07 13

PART 1 - GENERAL

1.1 REFERENCES

.1 Section 22 05 00 in this Division of the Specification applies to and is a part of this Section.

.2 Section 22 05 15 in this Division of the Specification also applies to and is a part of this Section of the Specification. The Section contains requirements, products and methods of execution that apply to this Section as well as other Sections of Division 22/23.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS OR PROVIDED BY OWNER

.1 The following work which is related to the power and heat generation work is specified in other Sections of the Specification (or provided by Owner as noted):

.1 provision of power wiring connections to boilers and boiler plant control panel, and all required 115 volt control wiring;

.2 provision of flues and stacks for natural gas fired equipment;

.3 supply of boiler boil-out chemical and embrittlement inhibitor.

1.3 SHOP DRAWINGS

.1 Submit shop drawings for all equipment and accessories specified in PART 2 of this Section.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 GAS PRESSURE

.1 Establish the pressure of the gas at all gas fired appliances prior to ordering the equipment.

3.2 NATURAL GAS SYSTEM PIPING INSTALLATION REQUIREMENTS

.1 Make all required arrangements with the natural gas supply Utility on behalf of the Owner for installation gas service piping with gas pressure regulator and meter assembly where shown.

.2 Provide all required natural gas distribution piping to connect gas fired or operated equipment, and provide all required vent piping to atmosphere. Do all piping work in accordance with requirements of CAN1-B149.1-15 as amended by the Ontario Gas Utilization Code and requirements of any other Governing Authority.

.3 Pipe shall be Schedule 40 mild black steel.

.4 Provide CGA approved ball type or lubricated plug type shut-off valves to isolate equipment, and wherever else shown.

.5 Slope gas piping in the direction of flow to low points.

.6 Provide full pipe diameter, 6" (150 mm) long drip pockets at the bottom of all vertical risers, at all piping low points, and wherever else shown and/or required.

.7 Identify all natural gas piping in accordance with requirements of Governing Authorities.

LUMINAIRE SPECIFICATION
SSM PLAZA
Sault Ste. Marie, ONTARIO

MULVEY & BANANI
LIGHTING

prepared for
Brook McIlroy
161 Spadina Ave, 2nd Floor
Toronto, Ontario M5V 2L6

prepared by:
MULVEY & BANANI INTERNATIONAL INC.
90 Sheppard Avenue East, Suite 500
Toronto, Ontario M2N 3A1
MBII Project No: 20-2029

issue date:
February 24, 2022

issued for
Tender

1.4.3 Photometric data to include: VCP Table and spacing criterion.

1.4.3.1 Submit manufacturer's technical data for LED drivers which are specified to be installed as indicated in Luminaire Schedule with each luminaire shop drawing. Attach driver technical data, which shall include:

1.4.3.1.1 operating watts;

1.4.3.1.2 input voltage;

1.4.3.1.3 power factor;

1.4.3.1.4 temperature range for operation;

1.4.3.1.5 regulation.

1.4.3.1.6 Confirmation of compatibility with LED manufacturer.

1.4.4 Lenses and Louvres

1.4.4.1 All fixtures shall be complete with internal lenses as specified.

1.4.4.2 Submit shop drawings of each lens and louvre specified along with fixture shop drawing.

1.5 **WASTE MANAGEMENT AND DISPOSAL**

1.5.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5.2 Place materials defined as hazardous or toxic waste in designated containers.

1.5.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.5.4 Disposal of fluorescent lamps.

1.5.5 Disposal of old PCB filled ballasts (if still existing) on renovation jobs.

1.6 **ACTION AND INFORMATIONAL SUBMITTALS**

1.6.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.6.2 Product Data:

1.6.2.1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

1.6.2.2 Provide complete photometric data prepared by independent testing laboratory for luminaires where specified, for review by Consultant.

©Mulvey & Banani International Inc.

2.1.1.4 LED Luminaire photometric performance and useful in-situ operating life expectations shall be based upon: LM-79 photometric test reports, associated supporting documentation for the LED devices used in the luminaire and calculations and supporting test data estimating lumen maintenance for the luminaire.

2.1.1.5 Unless otherwise specified Correlated Colour Temperature (CCT) to be 3,500K, with nominal CCT tolerances in accordance with ANSI C78.377

2.1.1.6 Color Maintenance: The change of chromaticity over the minimum lumen maintenance test period (6000 hours) shall be within 0.007 on the CIE 1976 (u',v') diagram.

2.1.1.7 Unless otherwise specified a minimum CRI of 70 shall be used for exterior rated fixtures. Unless otherwise specified a minimum CRI of 80 shall be used for interior rated fixtures. In addition, the R 9 value must be greater than 0.

2.1.1.8 Unless otherwise specified LED lumen Maintenance shall be LM ≥ 80% lumen maintenance (L 80) at 50,000 hours of operation: performance measured using the IES LM-80 and IES TM-21 protocols or based on 6,000 hours of luminaire testing, using a pass/fail threshold for lumen maintenance compliance as established by the Energy Star Manufacturer's Guide.

2.2 **LED DRIVER**

2.2.1 LED driver/power supply shall be dimmable via DALI, 0-10V, ELV, MLV, or DMX dimmers as per the fixture schedule.

2.2.2 Power factor - For LED engines >5W, must be ≥ 0.90

2.2.3 Electro-magnetic and Radio Frequency Interference - Integral LED lamps must meet the appropriate FCC requirements for consumer use (FCC Title 47 CFR Part 15 Class B).

2.2.4 Audible Noise - Lamps shall not emit noise above 24dBA at 1 meter or less meeting ANSI S12.55 – 2006 and ISO Standards.

2.2.5 Integral LED lamps must meet the requirements of ANSI/UL 1993 – 2009

2.2.6 Voltage fluctuation tolerance is ±10%.

2.2.7 Total harmonic distortion ≤20%. Drivers shall meet all applicable ANSI and IEEE standards regarding harmonic distortion and surge protection.

2.2.8 LED Operating temperature is -20°C to +40°C.

2.3 **LENSES**

2.3.1 Lenses shall be manufactured from injection molded clear acrylic.

2.3.2 Lenses shall be as follows unless otherwise noted:

2.3.2.1 A125 generic brand.

©Mulvey & Banani International Inc.

2.5 **LUMINAIRES**

2.5.1 General

2.5.1.1 Fixture bodies shall be of minimum 20 gauge, cold rolled prime steel of rigid construction with knockouts as required unless otherwise noted.

2.5.1.2 Fixture rigidity shall permit any suspension method without sag. Fluorescent fixtures shall be suitable for either individual or continuous mounting.

2.5.1.3 Fixtures shall be finished in baked white enamel with exposed surfaces matching the exposed tee-bars specified. Fixture finish shall resist chipping, corrosion, and discolouration. Before finishing, all metal shall be chemically degreased and neutralized. Finish shall not be less than two coats of enamel, sprayed and baked on. Reflecting surfaces shall be white with a reflectance of not less than 85%.

2.5.1.4 Fixture lenses, louvres and diffusers shall be rigid enough to be self-supporting without sag, easily removable but not loose. Provide additional thickness of lens to prevent sag at no extra cost to the Owner.

2.5.1.5 Where the Architect or Interior Designer is to select colours and finish of lighting fixtures after award of Contract, it shall be the responsibility of the Contractor to obtain this information well in advance of installation schedule.

2.5.2 Cash Allowances

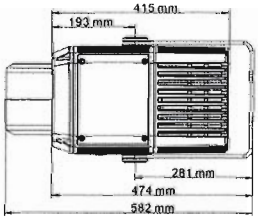
2.5.2.1 Contractor to carry following cash allowances as this part of their bid price. Prices include distributor mark-up only. Contractor to carry additional mark up in bid price if required. Cash allowances supply of the following luminaires before tax:

2.5.2.1.1 $50,000 in its entirety for the supply and partial install of Luminaire type LT-07 and required DMX controller and associated controls components. See luminaire type for details.

2.5.3 Luminaires

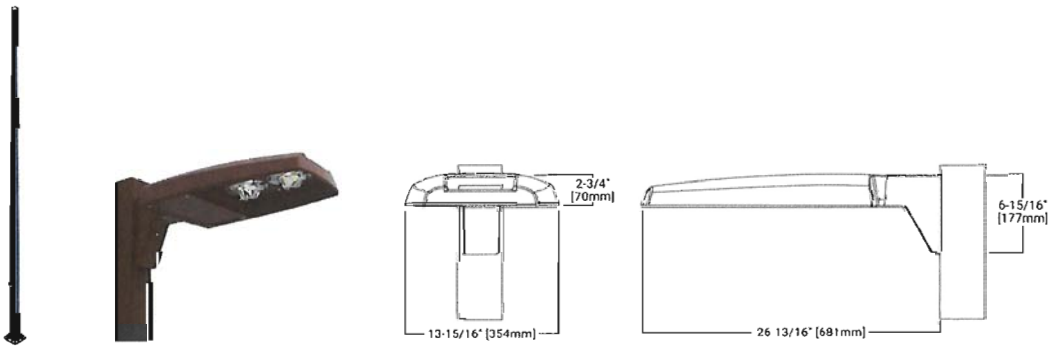
©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-02"							
Description:	Gobo Projector						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	320W	N/A	8300K	20,000hrs	DEL.	5700lms
						NOM.	N/A
Distribution:	**37 degrees**			**Efficacy:**	**18 lm/w**		
Ballast/Driver:	Integral Driver, DMX enabled						
Voltage:	100-240/277VAC 50/60Hz			**CRI:**	72		
Construction:	Aluminum			**Mounting:**	Pole Mounted – 35FT		
Finish:	Hard Anodized, metallic grey lacquered			**Trim Ring:**	N/A		
Shielding:	Glare shield			**Reflector:**	N/A		
Dimension:	**16.4in (L) x 11.6in (W) x 17.5in (H)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Gobo and color wheels to be supplied. Design of gobo and required colours TBD – Custom Gobos required 3. Luminaire to be pole mounted. Custom mounting required. Pole manufacturer to provide custom knock outs at specified locations for mounting of luminaires, refer to sheet E601 for mounting heights and details. Manufacturer to provide custom mounting adapted for pole mount application. 4. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system. 5. Manufacturer to supply Tapered Aluminum Pole - Aluminous Lighting Structures (Pole) RTAP35-845. Pole quantities as indicated on drawings						
Manufactures:	1. Martin – EXT Pro 500 *All proposed alternate luminaires shall be reviewed and approved by the design team.						
Location:	**Skating Rink**						



©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-04"							
Description:	Area Street Light						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	96W	N/A	3000K	194,000hrs	DEL.	12,901lms
						NOM.	13,100lms
Distribution:	**Type IV**			**Efficacy:**	**134 lm/w**		
Ballast/Driver:	Integral Driver, MSP/DIM-L30 – Integrated sensor for dimming operation						
Voltage:	100-277VAC			**CRI:**	70		
Construction:	Aluminum			**Mounting:**	Pole Mounted – 25FT		
Finish:	Black			**Trim Ring:**	N/A		
Shielding:	N/A			**Reflector:**	N/A		
Dimension:	**26 13/16in (L) x 13 15/16in (W) x 6 15/16in (H)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Luminaire to be pole mounted. 3. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system. 4. Luminaire to be supplied with integrated photocontrol sensor 5. Manufacturer to supply Aluminum Pole - Aluminous Lighting Structures (Pole) RTAP25-845/ RTAP35-845. Pole quantities as indicated on drawings						
Manufactures:	1. Cooper Lighting – Lumark PRV series *All proposed alternate luminaires shall be reviewed and approved by the design team.						
Location:	**Parking Lot**						



©Mulvey & Banani International Inc.

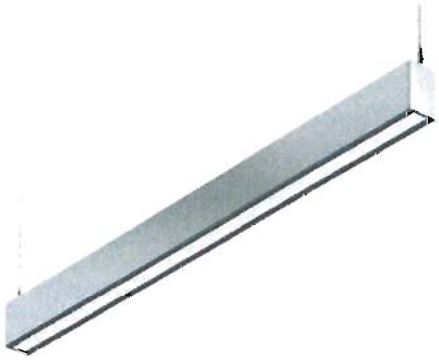
<table>
<tr><td colspan="8">LUMINAIRE TYPE: "LT-06"</td></tr>
<tr><td>Description:</td><td colspan="7">Linear Wall Wash</td></tr>
<tr><td rowspan="3">Lamp:</td><td>Type</td><td>Watt</td><td>Base</td><td>Colour Temp.</td><td>Average Rated Life</td><td colspan="2">Lumens</td></tr>
<tr><td rowspan="2">LED</td><td rowspan="2">4.4W/ft</td><td rowspan="2">N/A</td><td rowspan="2">3000K</td><td rowspan="2">60,000hrs</td><td>DEL.</td><td>559lms/ft</td></tr>
<tr><td>NOM.</td><td>N/A</td></tr>
<tr><td>Distribution:</td><td colspan="3">Diffused, Direct</td><td>Efficacy:</td><td colspan="2">50 lm/w</td></tr>
<tr><td>Ballast/Driver:</td><td colspan="7">Remote Driver, 0-10V Dimmable</td></tr>
<tr><td>Voltage:</td><td colspan="3">24VDC @ 120V, 60Hz</td><td>CRI:</td><td colspan="2">N/A</td></tr>
<tr><td>Construction:</td><td colspan="3">Aluminum</td><td>Mounting:</td><td colspan="2">Inground mounting channel. Cast in concrete curb. Provide waterproofing around perimeter of exposed luminaire.</td></tr>
<tr><td>Finish:</td><td colspan="3">Silver</td><td>Trim Ring:</td><td colspan="2">N/A</td></tr>
<tr><td>Shielding:</td><td colspan="3">Frosted hard resin</td><td>Reflector:</td><td colspan="2">N/A</td></tr>
<tr><td>Dimension:</td><td colspan="7">Refer to architectural drawing overall run lengths (L) x 84mm (W) x 74.6mm (H) x 1524mm illuminated segment (see sheet E-501)</td></tr>
<tr><td>Notes:</td><td colspan="7">1. Luminaire to be UL and cUL approved.
2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.
3. Provide non illuminated section between 5' segments of luminaire.
4. Remote drivers to be located in adjacent planter bed. Contractor to supply exterior rated enclosures to house DMX drivers. Size and quantity of enclosures to be dictated by manufacturer recommended qty of drivers per drawings.
5. LT-06 luminaires to be controlled by local 0-10V dimming switch located within driver enclosure. Supply one dimmer switch per enclosure. Qty of switches to be dictated by required qty of enclosures to house drivers.
6. Supply custom feed length appropriate per required driver location as indicated.</td></tr>
<tr><td>Manufactures:</td><td colspan="7">1. Senso Lighting – Trident Outdoor, Recessed Linear profile
* All proposed alternate luminaires shall be reviewed and approved by the design team.</td></tr>
<tr><td>Location:</td><td colspan="7">Ramp Wall</td></tr>
</table>

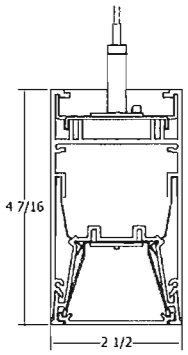
©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-07" – Cash Allowance							
Description:	Vertical Reeds						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	14.4W/m	N/A	RGB	50,000hrs	DEL.	N/A
						NOM.	402lms/ft
Distribution:	**120 degrees, Indirect**			**Efficacy:**	**90 lm/w**		
Ballast/Driver:	Remote Driver, DMX control						
Voltage:	24VDC @ 120V, 60Hz			**CRI:**	N/A		
Construction:	Aluminum			**Mounting:**	Surface Mounted		
Finish:	White			**Trim Ring:**	N/A		
Shielding:	N/A			**Reflector:**	N/A		
Dimension:	**Refer to Reed shop drawings**						
Notes:	1. Luminaire to be UL and cUL approved. 2. **Portion of the installation of Reeds/Tapelight to be completed by manufacturer. Contractor to coordinate scope with Sixpenny. Coordinate with David Nolan** mailto:david@sixpenny.ca 3. **Aurora DMX controller, enclosures, and corresponding components supplied by manufacturer. Contractor to coordinate scope with Limbic media. Coordinate with Jason Sanche** mailto:jason@limbicmedia.ca 4. Programming of Tapelights to be done by a specialized contractor. 5. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.						
Manufactures:	1. Controls, Reed Tapelight & Controls Enclosure – Limbic Media 2. Fabricated Reeds – Sixpenny Architectural Fabrication *Alternates not acceptable.						
Location:	**Stair/Play Area**						

©Mulvey & Banani International Inc.

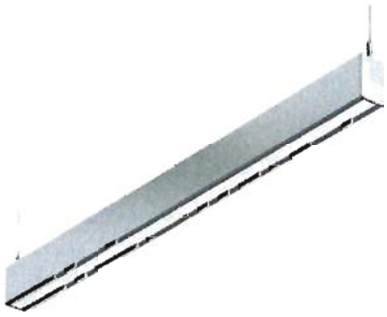
<table>
<tr><td colspan="8">LUMINAIRE TYPE: "LT-08"</td></tr>
<tr><td>Description:</td><td colspan="7">Suspended Linear (6')</td></tr>
<tr><td rowspan="3">Lamp:</td><td>Type</td><td>Watt</td><td>Base</td><td>Colour Temp.</td><td>Average Rated Life</td><td colspan="2">Lumens</td></tr>
<tr><td>Direct LED</td><td>3.6W/ft</td><td rowspan="2">N/A</td><td rowspan="2">3000K</td><td rowspan="2">60,000hrs</td><td>DEL.</td><td>N/A</td></tr>
<tr><td>Indirect LED</td><td>4W/ft</td><td rowspan="2">NOM.</td><td>400lm/ft Direct
600lm/ft Indirect</td></tr>
<tr><td>Distribution:</td><td colspan="3">Direct + Indirect Batwing, Diffuse</td><td>Efficacy:</td><td colspan="3">112 lm/w</td></tr>
<tr><td>Ballast/Driver:</td><td colspan="7">Integral LED Driver, 0-10V Dimming</td></tr>
<tr><td>Voltage:</td><td colspan="3">120V, 60Hz</td><td>CRI:</td><td colspan="3">80</td></tr>
<tr><td>Construction:</td><td colspan="3">Aluminum</td><td>Mounting:</td><td colspan="3">Suspended from u/s of slab. Fixture suspension to align with u/s of open web beams</td></tr>
<tr><td>Finish:</td><td colspan="3">Black – TBC with designer</td><td>Trim Ring:</td><td colspan="3">N/A</td></tr>
<tr><td>Shielding:</td><td colspan="3">Frosted lens</td><td>Reflector:</td><td colspan="3">Direct, Indirect Batwing</td></tr>
<tr><td>Dimension:</td><td colspan="7">88.9mm (W) x 95mm (H) x 1828.8mm (L)</td></tr>
<tr><td>Notes:</td><td colspan="7">1. Luminaire to be UL and cUL approved.
2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.
3. Supply Unistrut where required to avoid ceiling interferences.</td></tr>
<tr><td>Manufactures:</td><td colspan="7">1. Mark Architectural – Slot 4 Pendant
*Alternates to be reviewed and approved by designer.</td></tr>
<tr><td>Location:</td><td colspan="7">Skate Change area + office</td></tr>
</table>

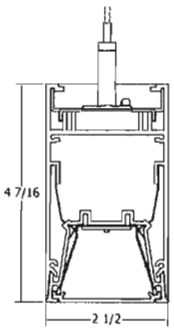




©Mulvey & Banani International Inc.

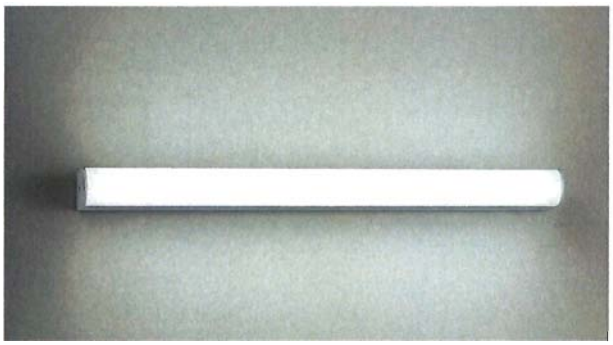
<table>
<tr><td colspan="8">LUMINAIRE TYPE: "LT-08B"</td></tr>
<tr><td>Description:</td><td colspan="7">Suspended Linear (8')</td></tr>
<tr><td rowspan="3">Lamp:</td><td>Type</td><td>Watt</td><td>Base</td><td>Colour Temp.</td><td>Average Rated Life</td><td colspan="2">Lumens</td></tr>
<tr><td>Direct LED</td><td>3.6W/ft</td><td rowspan="2">N/A</td><td rowspan="2">3000K</td><td rowspan="2">60,000hrs</td><td>DEL.</td><td>N/A</td></tr>
<tr><td>Indirect LED</td><td>4W/ft</td><td rowspan="2">NOM.</td><td>400lm/ft Direct
600lm/ft Indirect</td></tr>
<tr><td>Distribution:</td><td colspan="3">Direct + Indirect Batwing, Diffuse</td><td>Efficacy:</td><td colspan="3">112 lm/w</td></tr>
<tr><td>Ballast/Driver:</td><td colspan="7">Integral LED Driver, 0-10V Dimming</td></tr>
<tr><td>Voltage:</td><td colspan="3">120V, 60Hz</td><td>CRI:</td><td colspan="3">80</td></tr>
<tr><td>Construction:</td><td colspan="3">Aluminum</td><td>Mounting:</td><td colspan="3">Suspended from u/s of slab. Fixture suspension to align with u/s of open web beams</td></tr>
<tr><td>Finish:</td><td colspan="3">Black – TBC with designer</td><td>Trim Ring:</td><td colspan="3">N/A</td></tr>
<tr><td>Shielding:</td><td colspan="3">Frosted lens</td><td>Reflector:</td><td colspan="3">Direct, Indirect Batwing</td></tr>
<tr><td>Dimension:</td><td colspan="7">88.9mm (W) x 95mm (H) x 2440mm (L)</td></tr>
<tr><td>Notes:</td><td colspan="7">1. Luminaire to be UL and cUL approved.
2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.
3. Luminaires in office to be provided with white finish. Luminaires in skate change building to be provided with black finish.
4. Supply Unistrut where required to avoid ceiling interferences.</td></tr>
<tr><td>Manufactures:</td><td colspan="7">1. Mark Architectural – Slot 4 Pendant
*Alternates to be reviewed and approved by designer.</td></tr>
<tr><td>Location:</td><td colspan="7">Skate Change area, Office</td></tr>
</table>

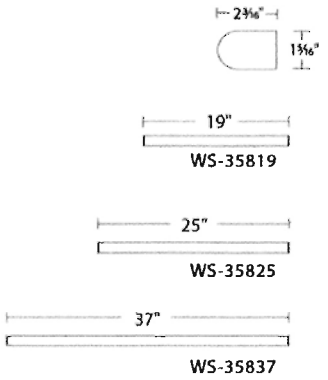




©Mulvey & Banani International Inc.

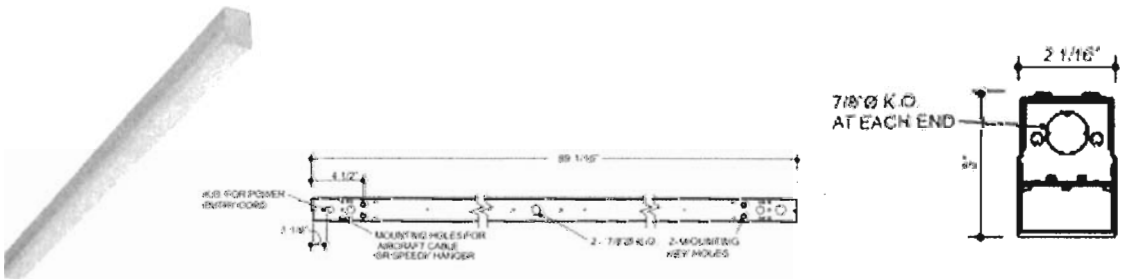
LUMINAIRE TYPE: "LT-10"							
Description:	Wall mount Vanity Sconce						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	34W	N/A	3000K	50,000hrs	DEL.	N/A
						NOM.	2585lm
Distribution:	**Radial, Diffuse**			**Efficacy:**	**100 lm/w**		
Ballast/Driver:	Integral LED Driver, ELV Dimming						
Voltage:	120V, 60Hz			**CRI:**	80		
Construction:	Aluminum			**Mounting:**	Wall mounted above vanity. Refer to architectural details for mounting height.		
Finish:	White – TBC with designer			**Trim Ring:**	N/A		
Shielding:	Frosted Lensed			**Reflector:**	Radial, Diffuse		
Dimension:	**25mm (H) x 50mm (D) x 635 mm (L)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.						
Manufactures:	1. Wac Lighting – Nightstick *Alternates to be reviewed and approved by designer.						
Location:	**Skate Change Building – Washrooms**						





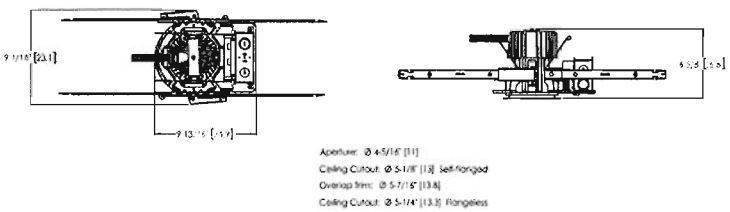
©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-11A"							
Description:	Linear Strip Light (4')						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	25W	N/A	3500K	60,000hrs	DEL.	N/A
						NOM.	3000lm
Distribution:	**Direct, Diffuse**			**Efficacy:**	**112 lm/w**		
Ballast/Driver:	Integral LED Driver, 0-10V Dimming						
Voltage:	120V, 60Hz			**CRI:**	80		
Construction:	Aluminum			**Mounting:**	Surface mounted or chain hung where required		
Finish:	white			**Trim Ring:**	N/A		
Shielding:	Frosted lens			**Reflector:**	N/A		
Dimension:	**50mm (W) x 85mm (H) x 2440mm (L)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system. 3. Luminaire to be supplied with chain suspension kit. Fixtures to be suspended as required to avoid ceiling interferences.						
Manufactures:	1. Lithonia Lighting ZL1N *Alternates to be reviewed and approved by designer.						
Location:	**Skate Change Building – BOH spaces**						



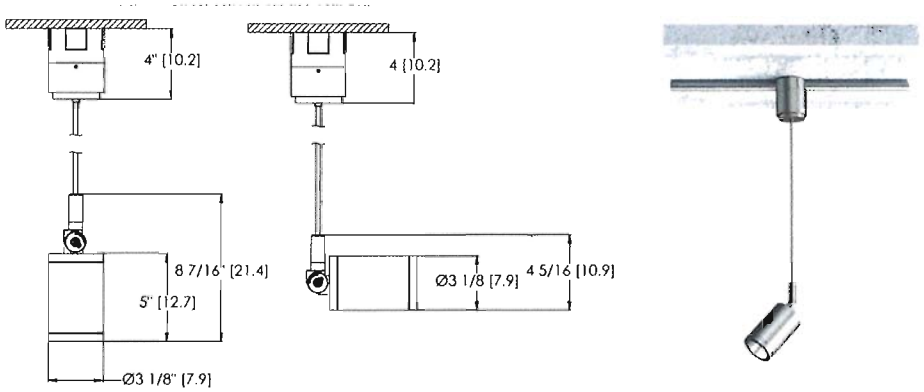
©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-12A"							
Description:	Recessed Downlight						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	19.5W	N/A	3000K	50,000hrs	DEL.	N/A
						NOM.	2000lm
Distribution:	**Direct, Diffuse 40deg beam**			**Efficacy:**	**100 lm/w**		
Ballast/Driver:	Integral LED Driver, 0-10V Dimming						
Voltage:	120V, 60Hz			**CRI:**	80		
Construction:	Aluminum			**Mounting:**	Recessed into tbar/gypsum ceiling		
Finish:	White - TBC with designer			**Trim Ring:**	White - TBC with designer		
Shielding:	open			**Reflector:**	Diffuse, 40deg beam LSS reflector		
Dimension:	**110mm (Ø) x 168mm (H)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system.						
Manufactures:	1. Gotham Evo 4 Downlight *Alternates to be reviewed and approved by designer.						
Location:	**Skate Change Building – Entry + Stair Vestibule + Office**						



©Mulvey & Banani International Inc.

LUMINAIRE TYPE: "LT-14"							
Description:	Suspended Stem Mounted Adjustable Cylinder						
Lamp:	**Type**	**Watt**	**Base**	**Colour Temp.**	**Average Rated Life**	**Lumens**	
	LED	19.5W	N/A	3500K	50,000hrs	DEL.	N/A
						NOM.	1500lm
Distribution:	**Direct, Diffuse 40deg beam**			**Efficacy:**	**100 lm/w**		
Ballast/Driver:	Integral LED Driver, 0-10V Dimming						
Voltage:	120V, 60Hz			**CRI:**	80		
Construction:	Aluminum			**Mounting:**	Direct conduit surface gear box mounting. Fixtures to be mounted at 2600 mm AFF.		
Finish:	Black – TBC with designer			**Trim Ring:**	N/A		
Shielding:	open			**Reflector:**	LSS, 40deg beam		
Dimension:	**790mm (Ø) x 127mm (H)**						
Notes:	1. Luminaire to be UL and cUL approved. 2. Luminaires to be supplied with all required hardware and mounting accessories as to provide a complete and functional system. 3. Conduit surface gear box finish to match fixture finish.						
Manufactures:	1. Gotham Incito 2 - ICO2PTRC *Alternates to be reviewed and approved by designer.						
Location:	**Skate Change Building – Main change area**						



©Mulvey & Banani International Inc.

CONTROL REQUIREMENTS "LT-05"

SGi
the LED lighting source
COMMERCIAL • LANDSCAPE • ARCHITECTURAL • RESIDENTIAL

Project: _____

Client: _____

Part #: CONTROL – 61– DMX – DECODER – 03

Date: ____ / ____ / ____ Qty: _____

INSTALLATION

15 Brownridge Rd. Unit 6, Halton Hills, ON L7G 0C6 • 905·487·8192 • 1·877·LED·2DAY • SGiLighting.com

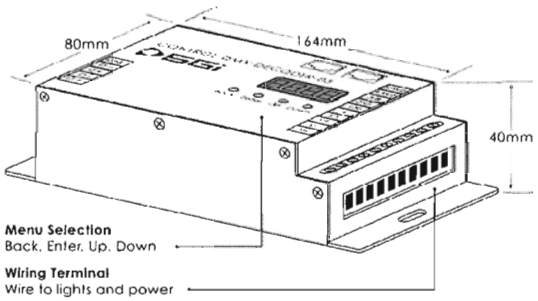
LED Controller • DMX RDM Decoder • Wiring Instructions

IMPORTANT:

Please follow wiring instructions carefully. Incorrect wiring can damage the decoders and void the warranty.

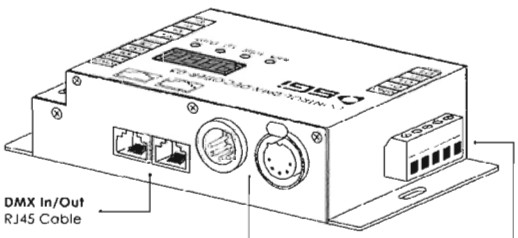
A single DMX Decoder can control up to 300 watts of LED light. (example Neon or UltraBright LED Flex equals 55 feet).

Use multiple DMX Decoders to control longer lengths of light.



Menu Selection
Back, Enter, Up, Down

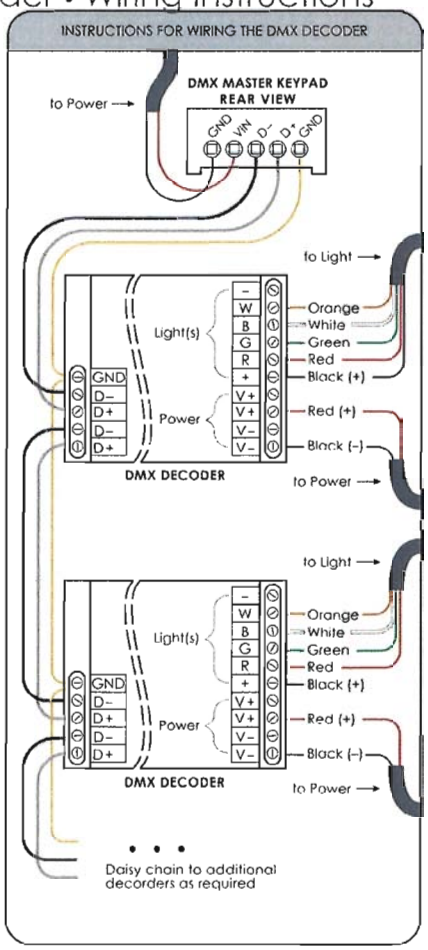
Wiring Terminal
Wire to lights and power



DMX In/Out
RJ45 Cable

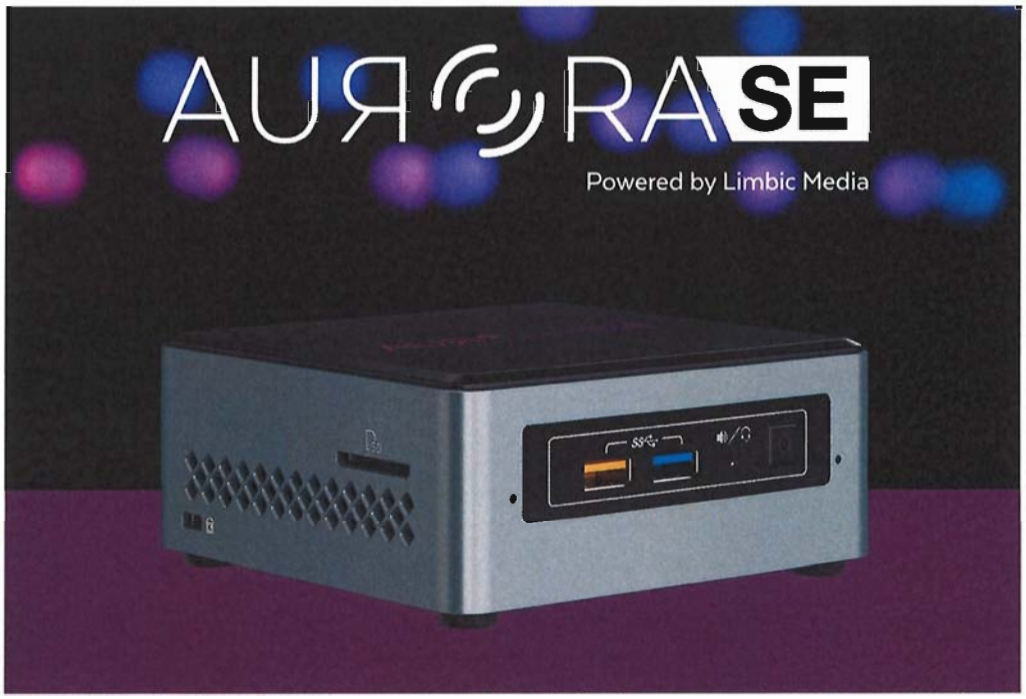
DMX In/Out
5 Pin DMX Cable

Wiring Terminal
Wire to keypad and multiple decoders.



Copyright © 2020 SGi Lighting Inc. the LED lighting Source. All rights reserved. REV20210306
Due to continuous improvements and innovations, specifications may change without notice

CONTROL SYSTEM FOR TYPES "LT-05 + LT-07" (included in cash allowance for LT-07)



Aurora SE is an advanced, real-time, interactive lighting controller. Aurora analyzes audio in real-time to generate dynamic lighting designs.

Aurora can also respond to other types of inputs such as voice recognition, text messages, sensors of any type such as motion and touch, or any real-time data streams such as social media.*

Placemaking. Public spaces are seeking new ways to connect people in an increasingly digital world. Choose sophisticated interactive experiences that engage audiences by turning spaces into places.

Drive more traffic. Encourage more of your audience to key locations and keep them there longer through emotive and engaging experiences, create lasting memories with their voices, motions, and media-based interactions.

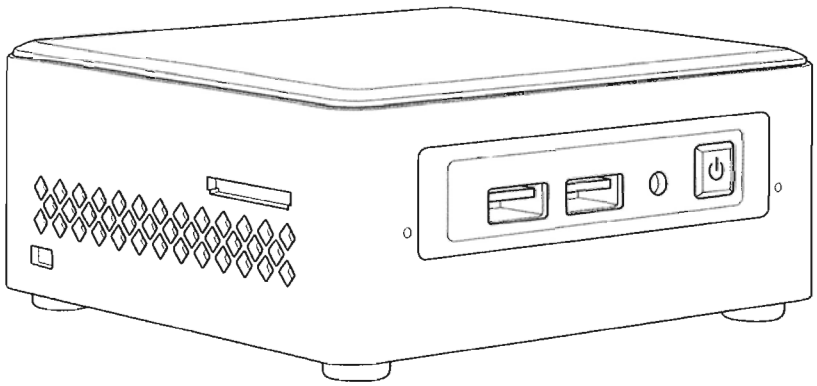
Sync your music. Easily sync any playlist of music in real-time to a dynamic light show. Customize lighting effects using the Aurora Mobile App.

Keep it fresh year after year. Build and expand on your Aurora-based installation by incorporating new paradigms of interaction and reinventing the experience year-after-year.

*May require additional custom development

©Mulvey & Banani International Inc.

CONTROL SYSTEM FOR TYPES "LT-05 + LT-07" CONTINUED



SPECIFICATIONS

Control, Electrical, Physical, Certification, Safety

Control

Connectivity	Dual Band Wi-Fi, USB 3.0 connectors x 4, ethernet, and built-in microphone
Optional	DMX IN/OUT/THRU, network distribution box, and audio interface

Electrical

Input Voltage	12-19V DC
Max. Input Current	3.43 A
Power Jack Size	5.5mm (outer diameter) 2.5mm (innerdiameter) with the shell as GND

©Mulvey & Banani International Inc.

DMX CONTROL SYSTEM FOR TYPES "LT-01 + LT-02 + LT-03"

pharos

TPC

Touch Panel Controller

Overview

The Pharos TPC (Touch Panel Controller) is an elegant lighting controller with a customisable, 4.3" capacitive touch screen, 512 channels of eDMX output and vast interfacing potential, all over a single Power-over-Ethernet (PoE) network connection. TPCs are available in a range of different coloured bezels and overlays.

Features

Touch Interface

Touch screen user interface is fully customisable using the free Pharos Designer software. Create multiple pages of controls including buttons, sliders, keypads and colour pickers, and configure their appearance and visual feedback. Make it eye-catching by importing your own graphics or picking from one of our attractive themes.

Pharos Engine

The intelligent Pharos Engine gives you complete control of your installation. Based on individually controllable and independently running timelines and scenes, it lets you build dynamic, precise, fully customisable pre-programmed lighting displays, all while giving you the freedom of real-time manual overrides, flexible multi-zone control, prioritisation and more.

Pharos Trigger

Timing is everything. Whatever the stimulus, Pharos Trigger can handle it. You can control your lighting with responsive, reactive programming. Pharos Trigger is a rules engine that uses conditional logic and a broad range of interfaces and protocols. Send and receive any command, to and from any system. Conditional logic is supported, along with a powerful built-in scripting language for unlimited flexibility.

Pharos Mapping

Design the big picture; control every pixel. Create a 2D map of your fixtures within the Designer software, then use Pharos Mapping to create visually stinking effects or play video across the entire array. Powerful controls allow you to build maps fast with pixel precise adjustment.

Scalable

The right fit for every installation. Multiple Pharos Controllers can be seamlessly linked together to work as one via a standard Ethernet network giving impressive scalability. For additional integration options simply add Remote Devices to further extend the network. Whether one Controller or many, it's all easily programmed using our Designer software.

Remote Management

The control you need in your browser - from anywhere. Pharos Controllers can be connected to Pharos Cloud, a secure remote management service from SixEye. This allows direct control of your Controllers from anywhere in the world, letting you check all of your Controllers' statuses, inputs and outputs, firing triggers, scheduling events, uploading new projects and much more. All Pharos controllers also have their own Web Interface that can be accessed on a local area network that provides real-time statuses, access to the full log and the ability to fire triggers on the controller.

Flexible

Be limited by your design brief, not your control system. Our products support a vast range of different fixture types and can output multiple DMX-over-Ethernet (eDMX) lighting protocols at the same time. No other system gives you this level of flexibility and control over your project

Pharos Designer

Programmed and configured using the free Pharos Designer software – available for Windows or Mac OS X – with upload over Ethernet.

Reliable

Hardware and firmware are self-sufficient, so no PC needs to be left on site. Rugged, compact unit designed for 24/7 operation and reliability.

EXT

DIN rail mounting companion product provides PoE power, DMX and DALI outputs, RS232 serial and 8 digital/analog inputs for triggering and integration

5 Year Warranty

Designed and manufactured in the UK, with quality and reliability our top priority.

Certifications

CE compliant, ETL/cETL listed, and California Title 20/24 compliant.

© 2004-2021 Pharos Architectural Controls Limited. All rights reserved.
Specifications subject to change without notice (01-05-2021).

©Mulvey & Banani International Inc.

DMX CONTROL SYSTEM FOR TYPES "LT-01 + LT-02 + LT-03" CONTINUED

pharos

LPC

Lighting Playback Controller

Overview

The Pharos LPC (Lighting Playback Controller) is an award-winning, all-in-one control solution for themed entertainment and LED lighting installations. It features individually controllable and independently running timelines and scenes, letting you build dynamic, precise, fully customisable pre-programmed lighting effects with the freedom of real-time manual overrides and the versatility of powerful show control and integration features.

Features

Pharos Engine
The intelligent Pharos Engine gives you complete control of your installation. Based on individually controllable and independently running timelines and scenes, it lets you build dynamic, precise, fully customisable pre-programmed lighting displays, all while giving you the freedom of real-time manual overrides, flexible multi-zone control, prioritisation and more.

Pharos Mapping
Design the big picture; control every pixel. Create a map of your fixtures within the Designer software, then use Pharos Mapping to create visually striking effects or play video across the entire array. Powerful controls allow you to build maps fast with pixel-precise adjustment. Multiple maps can be created to support different zones or for modelling different views of your installation.

Pharos Trigger
Timing is everything. Whatever the stimulus, Pharos Trigger can handle it. You can control your lighting with responsive, reactive programming. Pharos Trigger is a rules engine that uses conditional logic and a broad range of interfaces and protocols. Send and receive any command, to and from any system. Conditional logic is supported, along with a powerful built-in scripting language for unlimited flexibility.

Scalable
The right fit for every installation. Multiple Pharos Controllers can be seamlessly linked together to work as one via a standard Ethernet network giving impressive scalability. For additional integration options simply add Remote Devices to further extend the network. Whether one Controller or many, it's all easily programmed using our Designer software.

Flexible
Be limited by your design brief, not your control system. Our products support a vast range of different fixture types and can output multiple DMX-over-Ethernet (sDMX) lighting protocols at the same time. No other system gives you this level of flexibility and control over your project.

Remote Management
The control you need in your browser - from anywhere. Pharos Controllers can be connected to Pharos Cloud, a secure remote management service from SixEye. This allows direct control of your Controllers from anywhere in the world, letting you check all of your Controllers' statuses, inputs and outputs, firing triggers, scheduling events, uploading new projects and much more. All Pharos controllers also have their own Web Interface that can be accessed on a local area network that provides real-time statuses, access to the full log and the ability to fire triggers on the controller.

Custom Interfaces
Create a custom web interface for your installation that gives your users the control they need and the look they expect. Our built-in web server supports an extensive JavaScript and HTTP API and access control with multiple user levels.

Pharos Designer
Programmed and configured using the free Pharos Designer software – available for Windows or Mac OS X – with upload over Ethernet.

Reliable
Hardware and firmware are self-sufficient, so no PC needs to be left on site. Rugged, compact unit designed for 24/7 operation and reliability.

Installer Friendly
Made for permanent installation, with installer-friendly connectors and easy DIN rail mounting.

5 Year Warranty
Designed and manufactured in the UK, with quality and reliability our top priority.

Certifications
CE compliant, ETL/cETL listed, and California Title 20/24 compliant.

© 2004-2021 Pharos Architectural Controls Limited. All rights reserved.
Specifications subject to change without notice (01-05-2021)

©Mulvey & Banani International Inc.

DMX CONTROL SYSTEM FOR TYPES "LT-01 + LT-02 + LT-03" CONTINUED

pharos

EDN

Ethernet Data Node

Overview

The Pharos EDN (Ethernet Data Node) is a convenient and scalable solution, providing cost-effective Ethernet-distributed DMX ports for large control projects. The EDN is an easily configurable networking node that is specifically designed to add physical DMX ports to Pharos Controllers and integrates natively with the full Pharos range.

Extremely compact, it packs up to 20 DMX512 output ports into a 1U 19" form factor. For higher port count installations, nodes can be daisy-chained to provide as many physical DMX ports as you need.

EDNs are discoverable through Pharos Designer software and associated to a Controller to be seamlessly configured as part of your patch. Ports can be flexibly assigned to any controller in your project providing an elegant data distribution solution over an Ethernet network with minimal setup required.

Features

Isolation
The EDN offers up to 20 DMX512 output ports to control your fixtures. Each port is independently galvanically isolated up to 2kV, ensuring the control circuitry and each port of the EDN is protected against a multitude of electrical line faults, including earth potential rise and ground loops.

Protection
The EDN is equipped with "self-healing" DMX ports, giving your equipment added protection from incorrect setup and energy surges, such as short circuits, power induction and AC power faults. Should an energy surge occur, it will be contained by the EDN, preventing it from flowing into other components; once the external fault is cleared, the ports "self-heal", restoring DMX output automatically.

Integration
Built from the ground up on Pharos technology, the EDN natively interfaces with the rest of the Pharos product range including Pharos Designer software. Connecting it to your Designer lighting project is as simple as ensuring the EDN is on the same network as the Controllers. From there, Designer will detect it, giving you full control of your Ethernet network lighting solution with minimal effort.

Scalable
Up to 200 EDN units and other Remote Devices can be combined with one or more Pharos Controllers on the same network to build the ideal system for your installation. Each Remote Device is easily addressed using a convenient thumb wheel. Whether one Controller or many, it's all easily programmed using the Designer software.

RDM Capable (From Designer v2.8)
Supports the Remote Device Management protocol (ANSI E1.20), allowing fixtures connected to any of the DMX512 outputs to communicate back to their respectively assigned Controllers over an Ethernet network.

Network
Works with any Controller in the Pharos range over an Ethernet network. A second network port is provided for daisy-chaining EDNs together. Our recommended limit of 8 daisy-chained EDNs is to ensure high performance; if that number is exceeded, some latency could become apparent.

SDI
Accessory for the EDN supporting serial data protocol outputs for controlling products such as addressable LED tape.

Installer Friendly
Made for permanent installation, with installer-friendly connectors and easy 19" rack mounting.

Reliable
Solid-state design for 24/7 operation and reliability.

5 Year Warranty
Designed in the UK, with quality and reliability our top priority.

Certifications
CE compliant, ETL/cETL compliant, and California Title 20/24 compliant.

© 2004-2021 Pharos Architectural Controls Limited. All rights reserved.
Specifications subject to change without notice (01-05-2021).

©Mulvey & Banani International Inc.

3.2 **INSTALLATION**

3.2.1 Luminaire

3.2.1.1 Install luminaires accurately and carefully aligned complete with all mounting hardware. Ensure any suspension rods are vertical.

3.2.1.2 All luminaires shall be supplied with accessory items such as yokes, plaster rings, frame adjusters, etc. where required for proper installation.

3.2.1.3 Where recessed luminaires are specified for installation in acoustic tile ceilings, provide narrow profile trim ring. If luminaires are to be installed in drywall or plaster ceilings, use trimless plaster rims.

3.2.1.4 Where recessed linear luminaires are to be installed in drywall or plaster ceilings, provide suitable frame for luminaire installation.

3.2.1.5 Where "surface mounted" luminaires are specified for use in elevator, mechanical or electrical equipment rooms, install slotted reflectors and install on chains, after and below equipment, ductwork and piping are installed, but not below 2.1m (7 ft.), unless noted otherwise.

3.2.1.6 Dimensions of coves, valences and bulkheads as indicated on the drawings, are for general information only. Exact dimensions shall be job measured, or obtained from Architectural drawings.

3.2.1.7 At the time of date of "Substantial Completion", all luminaires, lenses, louvres and lamps must be clean and the lamps illuminated.

3.2.1.8 All fixtures shall be installed in accordance with the manufacturer's instructions.

3.2.1.9 This Contractor shall be responsible for checking the ceiling finishes in all areas where recessed fixtures are being installed to ensure that the fixtures ordered for these areas are purchased with suitable ceiling trim for the ceiling finish. Fixtures which are delivered to the site with wrong ceiling trim or flanges shall be replaced with the correct trims at no additional cost to the Owner.

3.2.1.10 If lighting fixtures penetrate a fire rated ceiling, they shall be enclosed with suitable fire rated enclosure above the ceiling having the same fire rating as the ceiling. Carefully check the architectural Contract Documents for ceiling details and shall ensure the fire rated enclosures are provided to maintain integrity.

3.2.1.11 Fixtures shall be properly cleaned at the time of installation. Any fixtures showing marks or scratches due to handling or tool marks, shall be replaced.

©Mulvey & Banani International Inc.

3.3.3.4 Programming of touch screen station(s) and/or preset station(s).

3.4 **LENSES AND LOUVRES**

3.4.1 Install lenses and louvers in fixtures.

3.5 **LIGHTING FOCUS**

3.5.1 The Contractor(s) responsible for focusing all adjustable luminaires shall provide/complete the following items:

3.5.2 Experienced lighting technicians as required with knowledge of specified luminaires and control systems which control them for duration of focus.

3.5.3 Installation of lighting accessories and required manipulation of luminaires to achieve lighting designer's desired effect and look; contractor to provide a reasonable amount of time to adjust all luminaires.

3.5.4 Automated Man Lifts with positioning abilities to reach all lighting positions and appropriate safety equipment and trained/certified staff to operate.

END OF SECTION

©Mulvey & Banani International Inc.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01330 - Submittal Procedures.

.2 Submit to the Consultant, samples of material for sieve analysis at least three (3) weeks before commencing asphalt work.

1.4 TESTING

.1 Contact the testing agency for compaction and materials tests as per Section 01 45 00 – Quality Control and Testing.

.2 Testing to be conducted for this section of work is as follows:
a) Sieve designation of specified aggregate.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Dispose in accordance with Section 02 61 33 Hazardous Materials and Section 02 50 13 Management of Toxic Waste.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.

.2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.3 Aggregate materials to satisfy the following requirements:

.1 Granular Base

.1 Granular A.

.1 As described in current OPSS 1010 – Aggregates for Granular O, A, B, M and Select Subgrade Materials.

.2 Consisting of hard, durable, angular particles; free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.3 Gradations: within limits specified when tested to current ASTM C 136 and ASTM C 117. Sieve sizes to current CAN/CGSB-8.1 rather than ASTM E 11.

.4 Liquid Limit current ASTM D 4318 Maximum 25.

.5 Plasticity Index current ASTM D 4318 Maximum 6.

.1 Bedding and joint sand: hard, durable, crushed stone particles, conforming to the gradation of concrete sand as specified in CAN/CSA A23.1.

.2 Do not use limestone screenings or stone dust for bedding or joint material.

.3 Gradation: to CAN/CSA-A23.1, Table I - Grading Limits for Fine Aggregate, and CSA A179 as follows:

Sieve Designation	% Passing Bedding Sand	% Passing Joint Sand
10 mm	100	-
5 mm	95-100	100
2.5 mm	80-100	95-100
1.25 mm	50-90	60-100
630 microns	25-65	-
315 microns	-	35-20
300 microns	10-35	-
160 microns	-	15-20
150 microns	-	2-15

.4 Jointing Sand: Polymeric sand – shall be free from clay lumps, cementation, organic material, frozen material, and other deleterious materials. Gradations: within limits specified when tested to ASTM C136 and ASTM C117.

.5 Colour: Grey

2.2 SOURCE QUALITY CONTROL

.1 Inform Consultant of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.

.2 If, in opinion of the Consultant, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Advise Consultant 4 weeks in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 EXECUTION

3.1 PREPARATION

.1 Processing

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

.1 Restore stockpile areas to pre-construction condition or as otherwise specified.

.2 Dispose of any unused aggregates.

END OF SECTION

PART 3 - EXECUTION

3.1 Dewatering

.1 Bail, pump out or divert water from excavations, from whatever cause, as it accumulates, and until the permanent drainage is operational and foundations are in place.

3.2 Excavating

.1 Excavate to elevations and dimensions required for installation, construction and inspection of the *Work*. Remove and dispose of waste, soil and like materials from the *Place of the Work* and pay dumping costs.

.2 Removal of existing boulders and/or concrete elements up to a size of 1 m^3 (1.3 yd^3), encountered below existing grade while excavating, are included as part of the *Work*.

.3 Notify *Consultant* at each time of occurrence when existing boulders and/or concrete elements greater than 1 m^3 are encountered below existing grade, providing detailed record of each occurrence in writing. This record must be approved by the *Consultant* before claims for extras will be considered.

.4 If upon excavating to the specified elevations, it is found that existing conditions are not fulfilled, adjust the excavations accordingly, but only with the written authorization of the *Consultant*.

.5 Remove water, disturbed soil or foreign matter from footing excavations before placement of reinforcement or concrete.

.6 During cold weather, prevent soil which will be adjacent to or beneath concrete from freezing.

.7 Excavation will not be considered complete until the soil at founding elevation is inspected and approved by the geotechnical engineer.

3.3 Backfilling

.1 Commence backfilling after areas of *Work* to be backfilled have been inspected, and pipe and conduit joints tested and accepted by *Consultant*.

.2 Areas to be backfilled shall be free from debris, snow, ice, water or frozen ground. Backfill material shall not be frozen or contain ice, snow or debris.

.3 Prior to placing fill under concrete slabs, proofroll the subgrade as directed by the geotechnical engineer. Remove soft, wet, or other deleterious material and replace with approved fill compacted to 98% of its Standard Proctor Maximum Dry Density, or import granular fill to stabilize the subgrade, and form a working mat, under the supervision of geotechnical engineer.

.4 Backfill simultaneously each side of walls and other structures to equalize soil pressures.

.5 Obtain *Consultant's* acceptance prior to placing backfill against foundation walls enclosing interior space.

.6 Request reviews by *Consultant* and geotechnical engineer of excavation prior to beginning backfilling.

.2 Footing subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by *Consultant*.

.3 Inspections:

.1 Determine prior to placement of fill that site has been prepared in compliance with requirements.

.2 Determine that fill material and maximum lift thickness comply with requirements.

.3 Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

.4 Testing:

.1 Testing company will test compaction of soils in place according to requirements of *Contract Documents*. Tests will be performed at the following locations and frequencies:

.1 Paved and building slab areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 200 sq. m (2152 sq. ft.) or less, but in no case fewer than three tests.

.2 Foundation wall backfill: At each compacted backfill layer, at least one test for every 30 m (100 feet) or less of wall length, but no fewer than two tests.

.3 Trench backfill: At each compacted initial and final backfill layer, at least one test for every 50 m (164 feet) or less of trench length, but no fewer than two tests.

3.6 Protection

.1 Protect excavated areas from exposure to sun and rain which would cause cave-ins or softening of beds on which foundations and drains rest. Prevent flow of water and earth fines into excavated pits and trenches. Seal or divert flow from springs that fill excavations.

.2 Protect bottoms of excavations from softening. Should softening occur, remove softened soil and replace with approved material.

.3 Protect bottoms of excavations from freezing.

.4 Effect measures to minimize dust as result of the *Work*.

END OF SECTION

.3 Silt fencing in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.

.2 Commence topsoil stripping of areas as indicated on drawings after site has been cleared and temporary silt protection fencing has been properly installed.

.3 Strip topsoil to depths indicated on the drawings.

.4 Do not mix topsoil with subsoil.

.5 Stockpile in locations as indicated on the drawings.

.6 Dispose of unused topsoil off site.

3.2 ROUGH GRADING

.1 Verify rough grades and notify the City and/or Consultant of discrepancies prior to performing work.

.2 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated on drawings.

.3 Ensure positive drainage at all times throughout the site and notify the City and/ or Consultant immediately of problem/ponding areas.

.4 Rough grade to specific depths below finish grades and to accommodate as sub-surface drainage lines as indicated on drawings.

.5 Place fill material in maximum 250mm lifts.

.6 Slope rough grade away from buildings/ structures.

.7 Grade slopes for landscape areas to a maximum of 3:1 unless otherwise specified on drawings.

.8 Grade ditches and swales to depths indicated on drawings. Ensure gradient transitions are smooth and drain in the direction indicated on drawings.

.9 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.10 Compact filled and disturbed area as specified in the Geotechnical Report.

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All Division 1 Specification Sections
.2 Section 31 05 17 – Aggregate Materials
.3 Section 31 23 13 – Rough Grading
.4 Section 31 32 21 - Geotextiles
.5 Section 32 01 91 - Tree and Shrub Preservation

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)
  .1 Current CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  .2 Current CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.

.2 Canadian Standards Association (CSA)
  .1 Current CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

1.3 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

  .1 Rock: any solid material in excess of $0.25m^3$ and which cannot be removed by means of mechanical excavating equipment having a $0.95\ m^3$ to $1.15m^3$ bucket. Frozen material not classified as rock.

  .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in work.

.3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.4 Waste material: excavated material unsuitable for use in work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work.

.6 Unsuitable materials:
  .1 Weak and compressible materials under excavated areas.
  .2 Frost susceptible materials under excavated areas.
    .1 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

1.4 SAMPLES

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 STOCKPILING

.1 Stockpile fill materials in designated areas.

.2 Stockpile granular materials in manner to prevent segregation.

.3 Protect fill materials from contamination.

3.5 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while work is in progress.

.2 Submit for City's approval, details of proposed de-watering or heave prevention methods such as dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with in a manner not detrimental to public and private property, or any portion of work completed or under construction.

.6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.6 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions as indicated.

.2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation.

.3 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.

.4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.5 For trench excavation, do not excavate more than 30m of trench in advance of installation operations and do not leave open more than 5m at end of day's operation.

.6 Dispose of surplus and unsuitable excavated material off site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.3 Place layers simultaneously on both sides of installed work to equalize loading.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 28 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from the City and/or Consultant or :

.2 If approved by The City and/or Consultant, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by the City and/ or Consultant.

.8 Install drainage system in backfill as indicated.

.9 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

3.9 RESTORATION

.1 Upon completion of work, remove waste materials and debris, trim slopes, and correct defects as indicated.

.2 Replace topsoil as indicated.

.3 Clean and reinstate areas affected by work to condition which existed before excavation.

.4 Reinstate prescribed surface materials to elevation which existed before excavation.

.5 Reinstate road pavement, sidewalks, lawns and plantings to condition which existed before excavation.

END OF SECTION

.4 Sediment control fence shall be free of holes, tears and punctures and be promptly replaced should damage or wear occur.

2.2 MUD MAT

.1 Mud mat shall be used as a temporary measure in accordance with manufacturer's instructions and be removed promptly upon completion of work.

PART 3 EXECUTION

3.1 MONITORING

.1 The Contractor shall ensure that erosion and sediment control measures are in effective working order, their condition shall be monitored prior to any forecast storm event and following a storm event.

3.2 MAINTENANCE

.1 All measures installed under the terms and conditions of this specification are to be maintained in an effective, functioning and stable condition.

3.3 SEDIMENT REMOVAL

1. Sediment that is accumulated by sediment barriers, cut-off swale, excavated traps, sediment interceptors, and dewatering traps, shall be removed in a manner that avoids escape to the downstream side of the control measures and avoids damage to the control measures.

.2 Sediment shall be removed to the level of the grade existing at the time of acceptance of the site and shall conform to the following:

.1 For all control measures, accumulated sediment shall be removed as necessary to perform maintenance repairs.

.2 Accumulated sediment shall be removed immediately prior to the removal of the control measures.

3.3 REMOVAL

.1 Examination

.1 Examine stabilization of the site and confirm by the City and/ or Consultant and approval agencies prior to starting removal of temporary control measures.

.2 Removal

.1 All temporary control measures shall be removed and dispose off-site once confirmed by the City and/or Consultant and approval agencies.

.2 Erosion and sediment control measures shall be removed in manner of avoid entry of equipment, other than hand-held equipment.

PART 1 GENERAL

1.1 RELATED WORK

.1 All Division 1 Specification Sections.
.2 Section 31 23 13 - Rough Grading
.3 Section 31 23 17 - Excavating, Trenching and Backfilling.
.4 Section 31 05 43 – Environmental Protection
.5 Section 32 91 21 – Topsoil Placement and Grading

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)
  .1 Current ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  .2 Current ASTM D 4595, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  .3 Current ASTM D 4716, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
  .4 Current ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Canadian General Standards Board (CGSB)
  .1 Current CAN/CGSB-4.2, Textile Test Methods.
  .2 Current CAN/CGSB-148.1, Methods of Testing Geotextiles and Geomembranes.
    .1 No.2, Mass per Unit Area.
    .2 No.3, Thickness of Geotextiles.
    .3 No.7.3, Grab Tensile Test for Geotextiles.
    .4 No.6.1, Bursting Strength of Geotextiles Under No Compressive Load.

.3 Canadian Standards Association (CSA)
  .1 Current CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel.
  .2 Current CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit a 1m length sample from full roll width of geotextile material to Consultant for approval prior to installation.

.3 Indicate manufacturer and source of geotextile.

1.4 DELIVERY AND STORAGE

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

3.2 PROTECTION

.1 No vehicles are permitted directly on geotextile.

END OF SECTION

.1 Shredded cedar bark: varying in size from 25 to 75 mm in length.
.2 Free of diseased wood, invasive species, weed seeds and deleterious material that could inhibit growth.

PART 3 EXECUTION

3.1 IDENTIFICATION AND PROTECTION

.1 Identify plants and the limit of their root system to be preserved as approved by City and/or Consultant.

.2 The location and installation of tree protection fencing must be reviewed and approved in writing by the City and/or Consultant prior to commencement of construction.

.3 No work and/or equipment shall be permitted on site until written approval by the City and/or Consultant has been issued.

.4 Protect plants and root systems from damage, compaction and contamination resulting from construction as approved by City and/or Consultant.

.5 Contractor is not permitted to change, alter, modify, or relocate the tree protection fencing without written approval by the City and/or Consultant.

3.2 TREE PROTECTION ZONE

.1 Install tree protection fencing in accordance with Table 1 unless indicated otherwise. The following is a chart showing minimum required distances for determining a tree protection zone (TPZ). Some trees and some site conditions may require a larger or smaller TPZ. Any form of deviation shall be approved in writing by the City and/or Consultant.

Table 1 – Tree Protection Zone (TPZ)

Trunk Diameter (DBH)*	Minimum Protection Distance Required**	Barrier Height
< 10 cm	1.8 m	1.2 m
11-40 cm	2.4 m	1.2 m
41-50 cm	3.0 m	2.4 m
51-60 cm	3.6 m	2.4 m
61-70 cm	4.2 m	2.4 m
71-80 cm	4.8 m	2.4 m
81-90 cm	5.4 m	2.4 m
91-100+ cm	6.0 m	2.4 m

* DBH means diameter at breast height when measured at 1.4m above grade

** Tree Protection Zone distances are measured from outside edge of tree base towards the dripline

.5 Trees being removed shall be cut rather than pushed over or pulled out with equipment.

3.5 WATERING

.1 Water preserved trees weekly in the absence of natural rainfall during the growing season. Soak area immediately below the tree crown.

.2 Water entire root zone to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

3.6 MULCHING

.1 Apply a 100mm layer of shredded cedar mulch over the root system of trees within the confines of the TPZ prior to the commencement of construction. Do not apply mulch any deeper than 100mm and do not pile against trunk. Refer to contract drawings for specific locations.

3.7 TRENCHING AND TUNNELLING FOR UNDERGROUND SERVICES

.1 Centre line location and limits of trench/tunnel excavation to be marked on site and approved by City and/or Consultant prior to excavation. Tunnel excavation to extend 2000 mm from edge of trunk on either side unless indicated otherwise.

.2 Manually excavate the instant when tree roots are encountered during construction. Do not sever roots greater than 40 mm diameter except when root depth is greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.

.3 Minimum acceptable depth to top of tunnel: 1000 mm.

.4 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree.

3.8 DAMAGE TO TREES

.1 Any damage or injury to trees shall be reported to the City immediately so that mitigation can take place without delay.

3.9 POST-CONSTRUCTION INSPECTION AND ASSESSMENT

.1 The City and/or Consultant shall assess the condition of all preserved trees and shrubs prior to Substantial Performance.

.2 Should any trees or shrubs exhibit damage due to an unauthorized breach of the TPZ, including but not limited to unauthorized grade changes, surface treatment, compaction, excavation, stockpiling of any kind, or physical injury to trunk, crown or roots, then the contractor shall be responsible for the damage.

3.13 MAINTENANCE DURING WARRANTY PERIOD

.1 Contractor shall submit to the City annual written reports for all trees and shrubs that have been affected during construction, identifying;
- .1 Maintenance work carried out.
- .2 Development and condition of plant material.
- .3 Preventative or corrective measures required which are outside the contractor's responsibility.

.2 Water all trees and shrubs that have been directly affected by construction as required to maintain healthy and vigorous growing conditions.

.3 Contractor shall be responsible to adhere to all remedial work as recommended in the Post-Construction Assessment Report at no additional cost to the City.

.4 Existing trees that have been designated to remain but are damaged beyond repair due to construction operations, as determined by the City and/or certified arborist, shall be removed at no additional cost to the City. Contractor is responsible to provide the City with compensation for all damaged trees as outlined above.

END OF SECTION

PART 2 PRODUCTS

2.1 MATERIALS

.1 Asphalt work materials and measurements to conform to applicable details.

.2 Prime coat: MTO Primer or SS-1 to OPSS1103.

.3 Tack coat: SS-1 to OPSS1103.

.4 Asphalt concrete: to OPSS1150.

.1	Hot mix, hot laid HL3F (Previously HL3A)	– 0% RAP
.2	Hot mix, hot laid HL3	– 0% RAP
.3	Hot mix, hot laid HL8	– max 20% RAP

.5 Granular base as indicated on drawings and as per Section 31 05 17 – Aggregate Materials.

.6 Granular sub-base as indicated on drawings and as per Section 31 05 17 – Aggregate Materials.

.7 Pavers: Mechanical grade controlled, self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated conforming to OPSS 310.06.01. Blade graders are not permitted for spreading asphalt.

.8 Rollers: Sufficient number of rollers of type and mass to obtain specified density of compact mix in accordance with OPSS 310.06.02.

PART 3 EXECUTION

3.1 SUBGRADE AND GRANULAR SUB-BASE

.1 Set out work to lines and levels shown on Drawings. Gain approval from the City and/or Consultant of lines and levels prior to sub-base installation. Maintain such lines and levels for duration of work.

.2 Excavate and prepare all subgrade as noted on details. Remove and dispose of existing unsuitable subgrade materials off site.

.3 Verify grades of subgrade for conformity with elevations and sections before placing base material.

.4 Disturbed subgrade or clean fill shall be compacted to 98% of Standard Proctor Maximum Dry Density in accordance with ASTM D698-70.

.5 Place sub-base material in 150mm lifts and compact each lift to 98% Standard Proctor Maximum Dry Density.

.2 Asphalt shall not be placed during rainfall, or on a surface which is wet or covered by ice or snow, or if the temperature is below recommendations in OPSS documents.

.3 Compact asphaltic mixture as soon as it can bear roller without undue displacement or hair cracking and continue until all roller marks are eliminated. Keep speed of roller slow enough to avoid displacement of mixture. Keep roller wheels slightly moistened by water to prevent adhesion of mixture. Excess water is not permitted. Compact mixture with hot tampers in locations that are not easily accessible to machine roller.

.4 Use self propelled Class 'B' roller for initial and final rolling.

.5 For vehicular areas carry out compaction in three operations in close sequence:

.1 "Breakdown" rolling with two wheeled rollers as soon as possible after spreading.
.2 Rolling with pneumatic tired or tandem rollers immediately after the first rolling to achieve the minimum specified density.
.3 Final rolling with two or three axle tandem rollers to remove roller marks.
.4 Compact mix with hot tampers or other equipment approved by the City and/or Consultant in areas inaccessible to rollers.

3.5 PAVEMENT CONSTRUCTION

.1 Application of prime coat: OPSS302.

.2 Construction of asphalt concrete: OPSS310.07.

3.6 FINISH TOLERANCES

.1 Upon completion of compaction each pavement course shall be:

.1 Smooth and true to crown and grade with variation not more than 3mm from thickness shown on drawings. Do not place any asphaltic course less than 25mm thick or more than 75mm thick.

.2 Finished asphalt surface to be within 6mm of design elevation, but not uniformly high or low, and with no irregularities greater than 10mm within every 4.5m.

.3 Compacted to a density of 92 to 96.5% MRD.

3.7 DEFECTIVE WORK

.1 Correct irregularities which develop before rolling is completed, by loosening surface mix and removing or adding material, as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to specified density.

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All Division 1 Specification Sections
.2 Section 03 30 00 – Cast-in-Place Concrete
.3 Section 31 05 17 – Aggregate Materials
.4 Section 31 32 21 – Geotextiles
.5 Section 32 13 15 – Concrete Walks, Curbs, and Gutters

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM):
  .1 Current ASTM C117, Test Method for Material Finer Than 75-[mu] m (No.200) Sieve in Mineral Aggregates by Washing.
  .2 Current ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  .3 Current ASTM C979, Standard Specification for Pigments for Integrally Coloured Concrete.
  .4 Current ASTM C698, Test Method for Chemical, Mass Spectrometric, and Spectrochemical Analysis of Nuclear-Grade Oxides ((U,Pu)O2).
  .5 Current ASTM C902, Specification for Pedestrian and Light Traffic Paving Brick.
  .6 Current ASTM C1272, Specification for Heavy Vehicular Paving Brick.
  .7 Current ASTM D698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort(600kN-m/m^3).
  .8 Current ASTM D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700kN-m/m^3).
  .9 Current ASTM E11, Specification for Wire-Cloth Sieves for Testing Purposes.

.2 Canadian General Standards Board (CGSB):
  .1 Current CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  .2 Current CAN/CGSB-8.2-, Sieves, Testing, Woven Wire, Metric.
  .3 Current CSA A283, Qualification Code for Concrete Testing Laboratories.

.3 Canadian Standards Association (CSA):
  .1 Current CSA A23.1/A23.2, Concrete Materials and Methods of Construction, Section 5.3.2./ Method of Test for Concrete.
  .2 Current CSA A179, Mortar and Grout for Unit Masonry.
  .3 Current CSA-A231.1, Precast Concrete Paving Slabs.
  .4 Current CSA-A231.2, Precast Concrete Pavers.
  .5 Current CSA A283, Qualification Code for Concrete Testing Laboratories.

1.3 PRODUCT DATA

.1 Submit following test data:
  .1 Sieve analysis for gradation of bedding and joint material.
  .2 Unit paver test data.

Edge Restraint: StructurEdge by Permaloc (www.permaloc.com) or approved equal

.4 Geotextile as detailed on drawings and as per Section 31 32 21 – Geotextiles.

2.2 BEDDING AND JOINT MATERIAL

.1 Bedding and joint sand as per Section 31 05 17 – Aggregate Materials.

2.3 CLEANING COMPOUND

.1 Clear, organic solvent, designed, recommended and approved by manufacturer for cleaning concrete pavers of contamination encountered.

.2 Acid based chemical detergent, designed, recommended and approved by manufacturer for removal of contamination encountered on pavers.

2.4 SEALING COMPOUND

.1 Clear acrylic or urethane, exterior type, water based, specially formulated for application on precast concrete pavers.

.2 Clear solvent based acrylic or urethane exterior type, containing co-polymer resins specially formulated for application on precast concrete pavers.

PART 3 EXECUTION

3.1 SUBGRADE

.1 Set out work to lines and levels shown on Drawings. Gain approval from the City and/or Consultant of lines and levels prior to sub-base installation. Maintain such lines and levels for duration of work.

.2 Excavate and prepare all subgrade as noted on details. Remove and dispose of existing unsuitable subgrade materials off site.

.3 Verify grades of subgrade for conformity with elevations and sections before placing base material.

.4 Disturbed subgrade or clean fill shall be compacted to 98% of Standard Proctor Density in accordance with ASTM D698-70.

.5 Obtain subgrade and sub-base approval from the City and/or Consultant prior to placing base material.

3.2 GRANULAR BASE

.1 Exercise caution at all times to prevent base material from becoming contaminated by clay or other deleterious materials.

.2 Place base material to compacted thickness as indicated on drawings.

.7 Surface of finished pavement: free from depressions exceeding 3 mm as measured with 3 m straight edge.
.8 Sweep surface clean and check final elevations for conformance to drawings.

.5 Lay pavers to pattern indicated on drawings. Joints between pavers as detailed on drawings.

.6 Use appropriate end, edge and corner stones. Saw cut pavers to fit around obstructions and at abutting structures.

.7 Installation by mechanical equipment:

.1 Prepare installation sequence to maximize project efficiency.
.2 Place paver pallets and other materials without exceeding load bearing capacity, or otherwise detrimentally affecting installations.
.3 Run equipment approved for installation only on paving surfaces vibrated in place.

.8 Use a low amplitude, high frequency plate compactor capable of at least 22 kN centrifugal compaction force to vibrate pavers into bedding sand.

.9 Inspect, remove, and replace chipped, broken and damaged pavers. Replace pavers removed without altering layout and structural quality.

.10 Sweep dry joint sand material into joints.

.11 Settle sand by vibrating pavers with plate compactor.

.12 Continue application of joint material and vibrating of pavers until joints are full.

.13 At the completion of each work day, ensure all work within 1 m of laying face is left fully compacted with sand filled joints.

.14 Sweep off excess joint material when installation is complete.

.15 Proofroll street pavements with at least two passes of a 10 T rubber-tired roller.

.16 Final surface elevations not to exceed plus or minus 3 mm under 3 m long straightedge.

.17 Surface elevation of pavers: maximum 3 mm above adjacent drainage inlets, concrete collars or channels.

.18 Ensure conformance of final elevations.

3.8 CLEANING

.1 Carry out cleaning at times and conditions recommended by manufacturer of cleaning compound immediately prior to sealing.

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All Division 1 Specification Sections
.2 Section 03 30 00 – Cast-in-Place Concrete
.3 Section 31 05 17 – Aggregate Materials
.4 Section 32 12 17 – Asphalt Paving

1.2 REFERENCES

.1 Canadian Standards Association (CSA).
  .1 Current CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.

.2 American Society for Testing and Materials (ASTM).
  .1 Current ASTMD698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

PART 2 PRODUCTS

2.1 MATERIALS

.1 Concrete work materials and measurements to conform to applicable details.

.2 Concrete mixes and materials, reinforcing steel, joint filler and curing compound as per Section 03 30 00 - Cast-in-Place Concrete.

.3 Granular base as indicated on drawings and as per Section 31 05 17 – Aggregate Materials.

.4 Granular sub-base as indicated on drawings and as per Section 31 05 17 – Aggregate Materials.

.5 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.

PART 3 EXECUTION

3.1 GRANULAR BASE

.1 Exercise caution at all times to prevent base material from becoming contaminated by clay or other deleterious materials.

.2 Place base material to compacted thickness as indicated on drawings.

.3 Place in layers not exceeding 150mm compacted thickness. Compact to density not less than 98% of Standard Proctor Maximum Dry Density in accordance with ASTM D698-70.

.2 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

.3 Apply curing compound evenly to form continuous film. In accordance with manufacturer's requirements.

3.6 BACKFILL

.1 Allow concrete to cure for 7 days prior to backfilling.

END OF SECTION

.4 Custom Stenciling Asphalt Paint:

.1 TBL Durables Paint. Layout and pattern as indicated on drawings.
.2 Colour:
Light Blue: RGB (0,124,176)
Dark Blue: RGB (0,83,135)
White: RGB (255,255,255)
.3 Organic solvent-based paint shall be homogenous and shall be well ground to a uniform smooth consistency. It shall be free from skin, dirt, and other foreign particles, and shall be capable of being sprayed at the temperature intended for application.

PART 3 EXECUTION

3.1 EQUIPMENT REQUIREMENTS

.1 Paint applicator to be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly and to dimensions as indicated, and to have positive shut-off.

3.2 CONDITION OF SURFACES

.1 Pavement surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

3.3 APPLICATION

.1 Lay out pavement markings.

.2 Apply paint only when air temperature is above 10°C, wind speed is less than 60km/h and no rain is forecast within next 4h.

.3 Do not thin paint.

.4 Symbols and letters to conform to dimensions indicated.

.5 Paint lines to be of uniform colour and density with sharp edges.

.6 Thoroughly clean distributor tank before refilling with paint of different colour.

3.5 TOLERANCE

.1 Paint markings to be within plus or minus 12mm of dimensions indicated.

3.6 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

END OF SECTION

.2 Product Data: Submit manufacturer's product data, including installation and subsurface instructions.

.3 Samples: Submit manufacturer's sample of 1 full tile for each colour specified.

.4 Test Reports: Submit certified test reports from qualified independent testing agency indicating results of the following tests:
- .1 Impact Attenuation: ASTM F 1292.
- .2 Freeze Thaw: ASTM C 67.
- .3 Rubber Deterioration/Air Oven: ASTM D 573.
- .4 Slip Resistance: ASTM D 2047 and E 303.
- .5 Tensile Strength: ASTM D 412.
- .6 Elongation at Break: ASTM D 412.
- .7 Tear Strength: ASTM D 624.
- .8 Peak Load: ASTM D 624.
- .9 Density: ASTM D 3676
- .10 Taber Abrasion: ASTM C 501.
- .11 Flammability: ASTM D 2859

.5 Certificate of Compliance: Submit manufacturer's certificate of compliance indicating materials comply with specified requirements.

.6 Manufacturer's Project References:
- .1 Submit list of 15 successfully completed projects.
- .2 Include project name and location, name of architect, and type and quantity of playground safety surfacing tiles furnished.

.7 Installer's Project References:
- .1 Submit copy of manufacturer issued installation certification

.8 Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

.9 Warranty: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

.1 Manufacturer's Qualifications: Manufacturer shall meet a minimum of 1 of the following 2 requirements.
- .1 Continuously engaged in manufacturing of playground safety surfacing tiles of similar type to that specified, with a minimum of 10 years successful experience
- .2 Furnished a minimum of 15,000,000 square feet of playground safety surfacing tiles of similar type to that specified.

.2 Installer's Qualifications:
- .1 Certified by manufacturer for installation of playground safety surfacing tiles.
- .2 Approved by manufacturer.

.2 Description: Resilient, interlocking, playground safety surfacing tiles.
.3 Compliance: Meet and exceed CPSC guidelines for impact attenuation.
.4 Material: Compression-molded, recycled rubber and binding agents.
.5 Tile Locking: U-shaped male and female configuration on all 4 sides to lock tiles to adjacent tiles.
.6 Top Edges: Chamfered.
.7 Tile Bottom: Hollow core stanchion pattern.
.8 Wear Layer
a. Premium Series: Virgin TPV rubber granules. Minimum 0.250 inch thick.
.9 Size: 24 1/8" X 24 1/8" Nominal.
Installed size: 24" X 24"
.10 Thickness: 4.25 inches.
.11 Minimum Weight Each Tile: Premium Series: 4.25-Inch Thickness: 34.00 pounds.
.12 Colours: Azure, pattern as shown on drawings.

.2 Test Results:
.1 Impact Attenuation, ASTM F 1292:
a. G-max Score: Less than 125.
b. Head Injury Criteria (HIC) Score: Less than 700.
.2 Freeze Thaw, ASTM C 67: No deterioration.
.3 Rubber Deterioration/Air Oven, ASTM D 573: No deterioration.
.4 Slip Resistance:
a. ASTM E 303:
a. Dry: 51 minimum
b. Wet: 44 minimum
b. ASTM D 2047:
a. Plus: 0.533
b. Premium: 0.601
.5 Tensile Strength, ASTM D 412: .636 Mpa.
.6 Elongation at Break, ASTM D 412: 35.3%
.7 Tear Strength, ASTM D 624: 2.4 kNm.
.8 Flammability:
a. Burning Pill, ASTM D 2859: Pass.
.9 Density, ASTM D 3676: 859 kg/m3
.10 Taber Abrasion, Wear index, ASTM C 501: 77

2.3 ACCESSORIES

.1 Corners:
.1 Prefabricated outside and inside corners.
.2 Material: Same as playground safety surfacing tiles.

.2 Adhesive: Furnished by manufacturer.

.2 Clean tiles in accordance with manufacturer's instructions.

3.6 PROTECTION

.1 Protect playground safety surfacing tiles from foot traffic for a minimum of 12 hours after installation.

.2 Protect completed tiles from damage during construction.

END OF SECTION

Removable Bollard

Model:	R-8464-RA Removable Bollard
Material/ Colour:	Stainless Steel
By:	Reliance Foundry
Phone:	877-789-3245

Trash and Recycling Receptacle

Surface Mounted Trash / Recycling Receptacles

Model:	SDC-36 (incl. custom plaque)
Material/ Colour:	Powder Coat RAL 9016 (White)
Contact:	Kevin Bettridge (Park Street Solutions)
Phone:	1-800-788-7408

Movable Table and Chairs:

Movable Table

Model:	Kontur Café Table
Material/ Colour:	Powder Coat RAL 9016 (White)
By:	Maglin Site Furniture
Contact:	Jeff Roddick
Phone:	1-800-716-5506

Movable Chairs

Model:	Kontur Freestanding Chair
Material/ Colour:	x9 Powder Coat RAL 5005 (Blue) x9 Powder Coat RAL 5018 (Turquoise)
By:	Maglin Site Furniture
Contact:	Jeff Roddick
Phone:	1-800-716-5506

Bicycle Rack

Model:	Ripple Rack
Material/ Colour:	Stainless Steel
By:	Greenspoke
Contact:	Shelley Wagner-Trombley (ABC Recreation)
Phone:	1-800-267-5753

Prefabricated Metal Screen:

Model:	6' Omega Unik Vertical Panel c/w 4x4" square posts and flanged post and cap
Pattern:	Reference 34
Material/ Colour:	Powder Coat RAL 9016 (White)
By:	Omega II Fence Systems
Contact:	Kevin Bettridge (Park Street Solutions)
Phone:	1-800-788-7408

Tactile Warning Strip:

Model:	Detectable Warning Plate
Material/ Colour:	Raw Cast Iron
Size:	varies, see drawings
By:	Neenah Foundry
Contact:	www.nfco.com

PART 3 EXECUTION

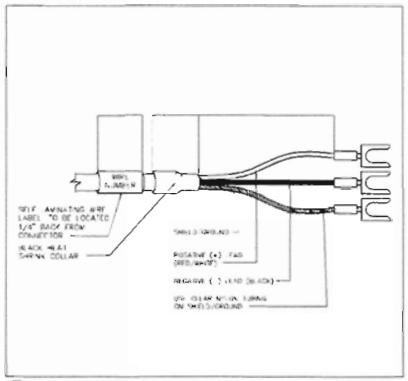
3.1 INSTALLATION

.1 Assemble and install all products in accordance with manufacturer's instructions.

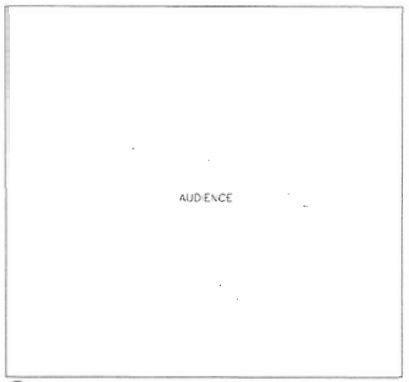
.2 Install all products true, plumb, and firmly anchored.

.3 Damaged products will be rejected.

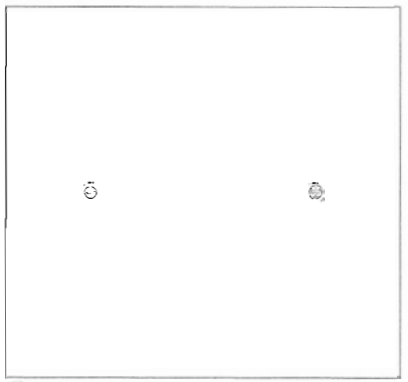
END OF SECTION



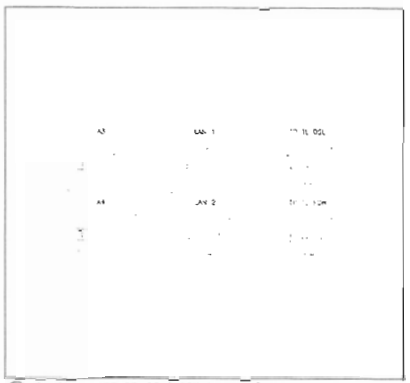
TYPICAL EXPOSED CONDUCTOR WIRE TERMINATION



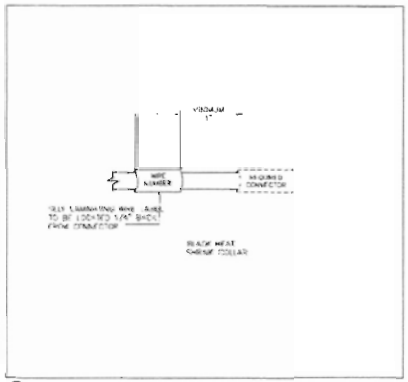
STAGE ORIENTATION DETAIL



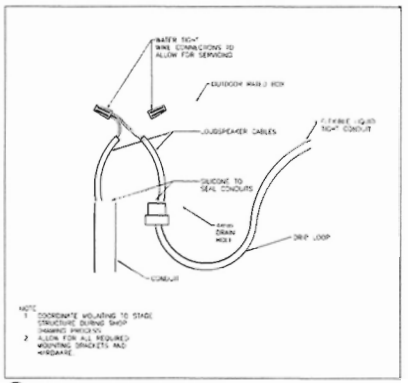
CUSTOM PLATE RP-01



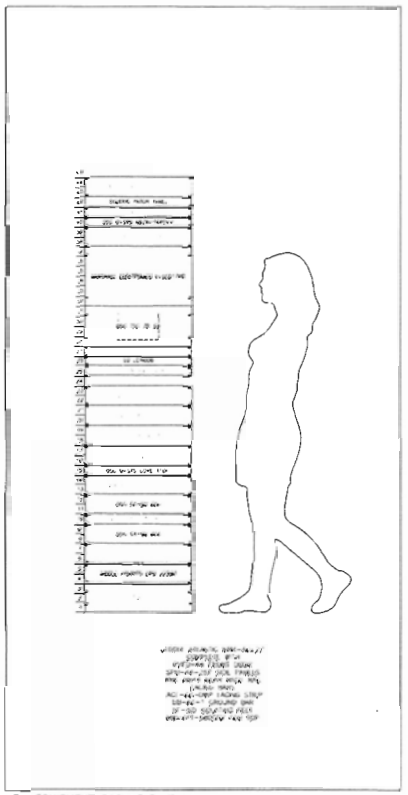
CUSTOM PLATE CP-03 (UPSTAGE RIGHT)



TYPICAL WIRE TERMINATION WITH CONNECTOR

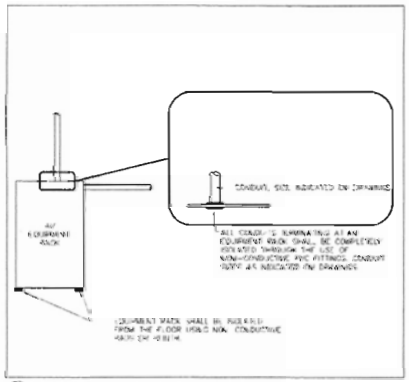


LOUDSPEAKER CONNECTION DETAIL

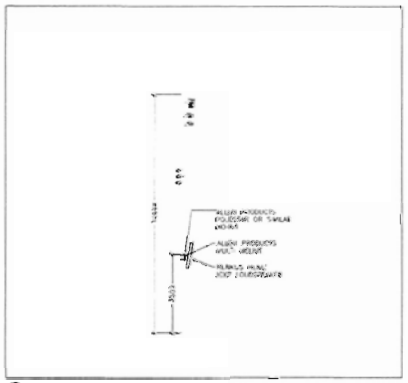


EQUIPMENT RACK ELEVATION

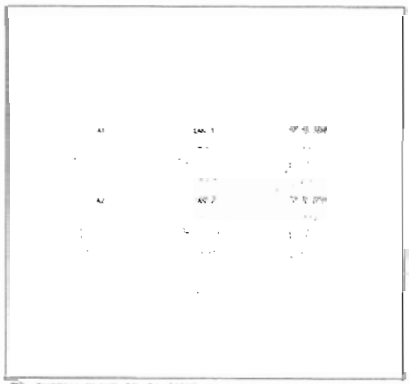
CUSTOM PLATE CP-02 (DOWN STAGE LEFT)



TYPICAL EQUIPMENT RACK ISOLATION DETAIL



RINK POLE LOUDSPEAKER DETAIL



CUSTOM PLATE CP-01 (FOH)

MULVEY & BANANI
AUDIO VISUAL

SAULT STE. MARIE
DOWNTOWN PLAZA

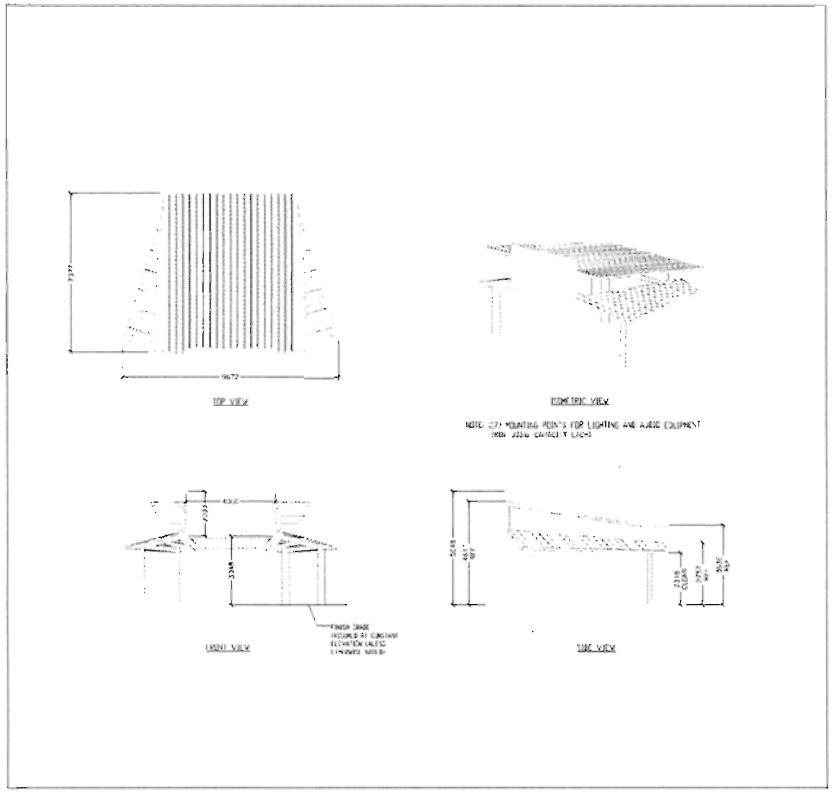
CITY OF SAULT STE. MARIE

BrookMcIlroy

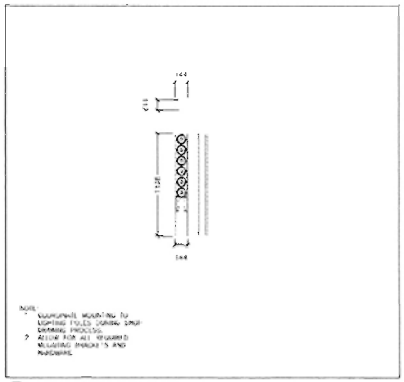
AUDIO VISUAL
DETAILS

2021-JUNE

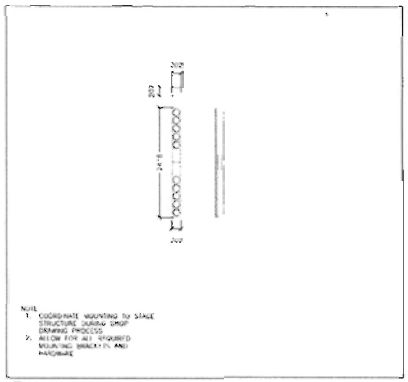
AV-702



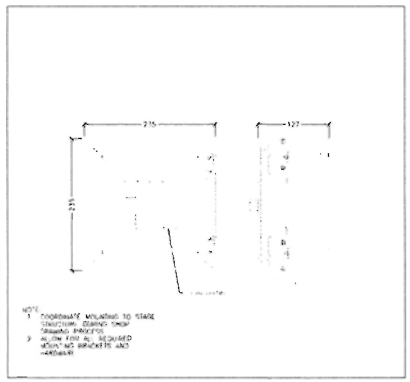
STAGE DETAILS



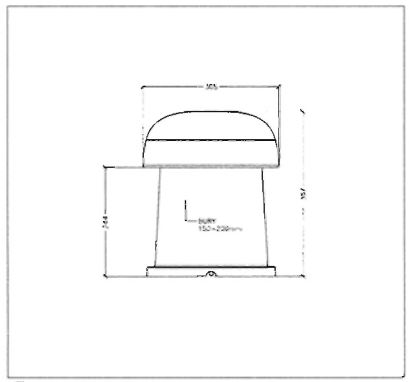
LOUDSPEAKER TYPE MSCA



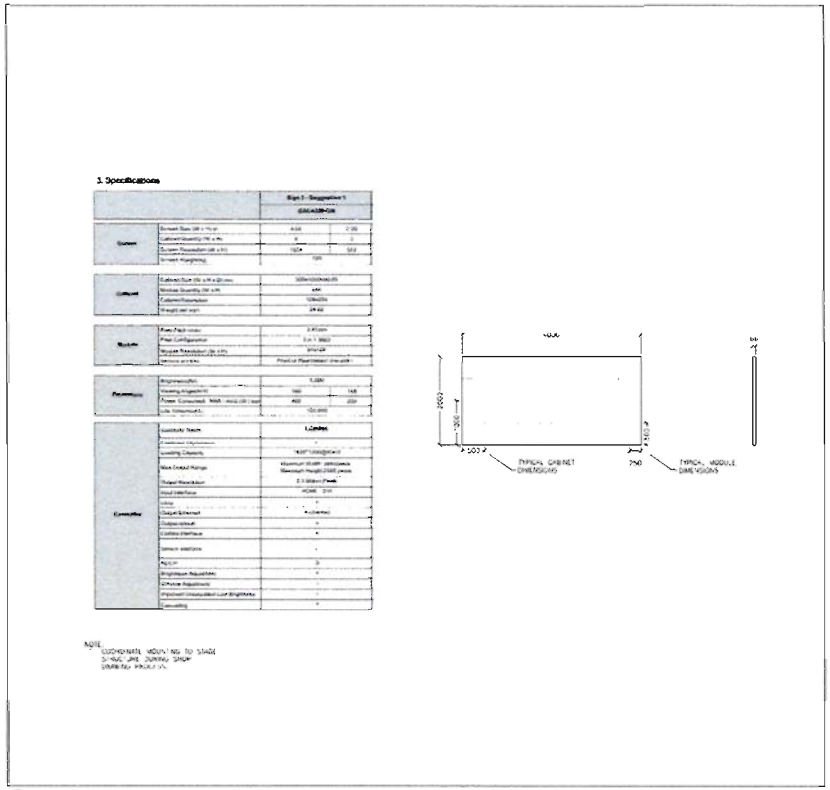
LOUDSPEAKER TYPE ESCA



FSR OWB-CP1 BOX



LOUDSPEAKER TYPE E6T



DVLED39 DETAILS

MULVEY & BANANI
AUDIO VISUAL

2 22-02-17 ISSUED FOR TENDER
1 21-09-17 ISSUED FOR SDS CD

PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

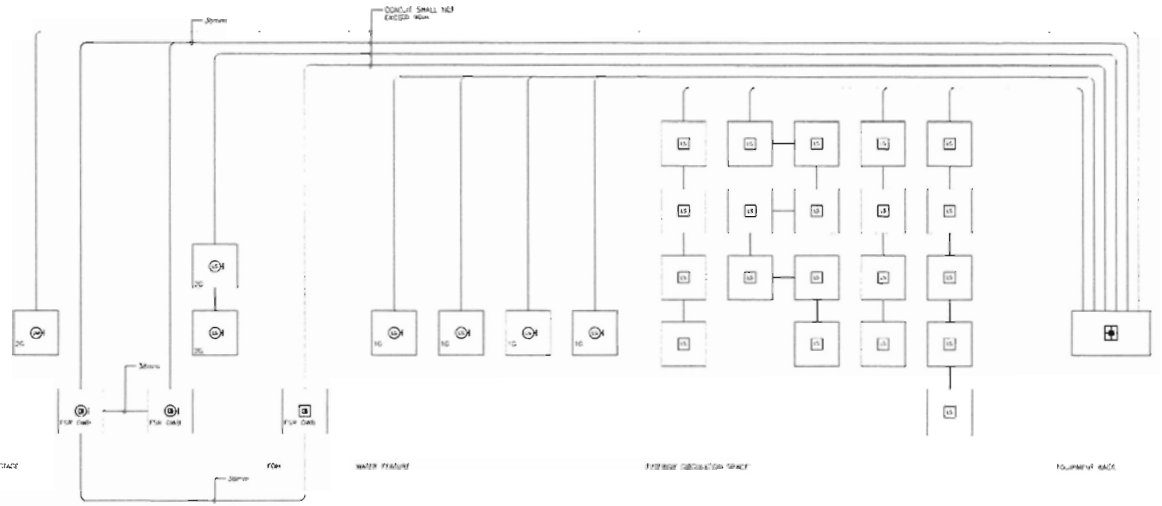
CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy/

SHEET TITLE
AUDIO VISUAL
DETAILS

PROJECT NO.
20-1620
DESIGNED
JC/GR
DRAWN
CHD
DATE
2021-JUNE
SCALE
N.T.S.

AV-701



AUDIO VISUAL INFRASTRUCTURE RISER

INFRASTRUCTURE NOTES

INFRASTRUCTURE LEGEND

MULVEY & BANANI
AUDIO VISUAL

2 22-02-17 ISSUED FOR TENDER
1 21-06-12 ISSUED FOR RFP

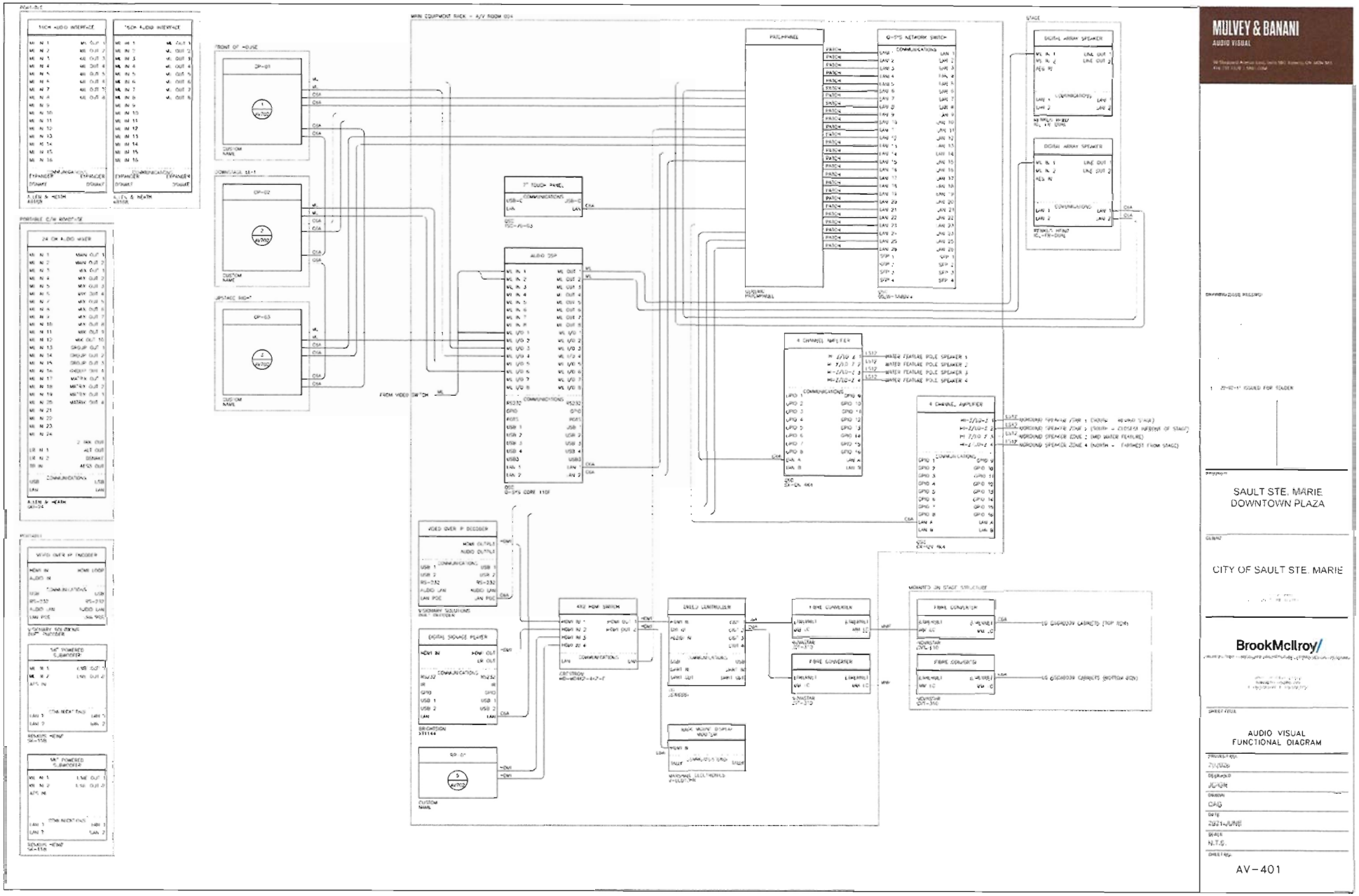
PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
AUDIO VISUAL
INFRASTRUCTURE RISER

PROJECT NO.
DRAWN
JC/AR
CHKD
CAD
DATE
2021-JUNE
SCALE
N.T.S.
SHEET NO.
AV-501


MULVEY & BANANI
AUDIO VISUAL
SAULT STE. MARIE
DOWNTOWN PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
AUDIO VISUAL
FUNCTIONAL DIAGRAM
2021-JUNE
N.T.S.
AV-401

MULVEY & BANANI
AUDIO VISUAL

[illegible]

ISSUED FOR TENDER

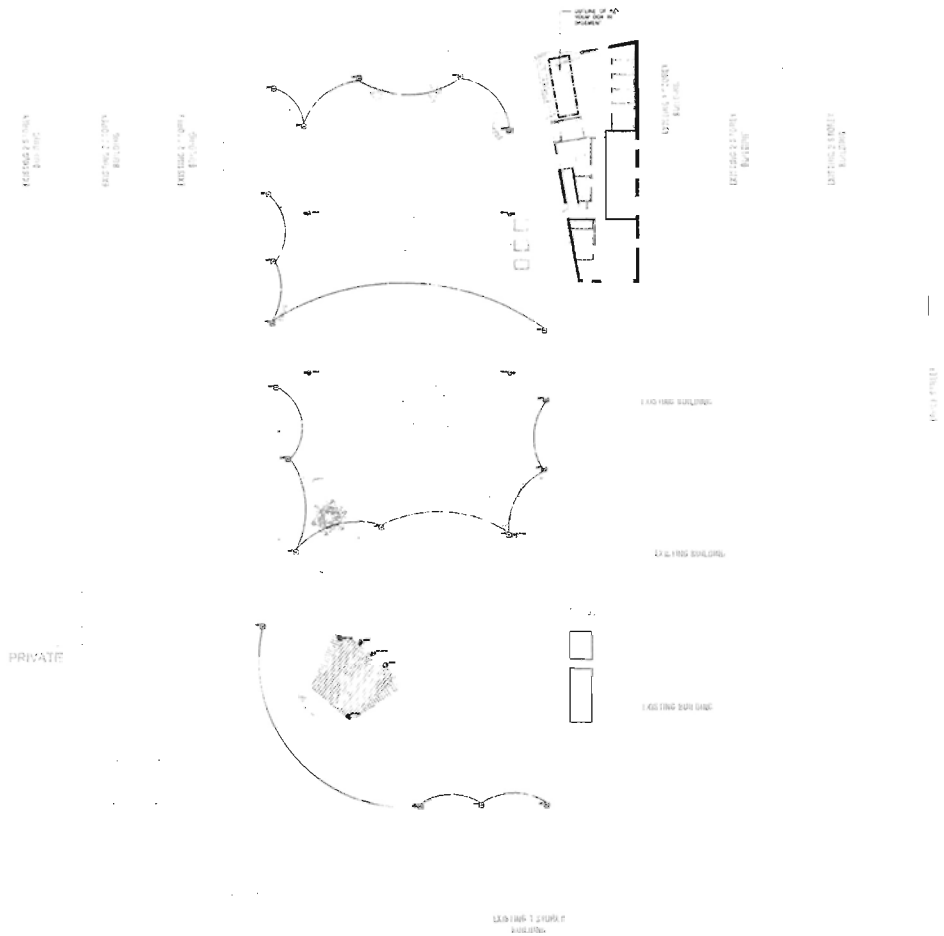
PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
SERVICE BUILDING BASEMENT -
AUDIO VISUAL SYSTEMS

PROJECT NO.
20-1628
DESIGNED
JC/SM
DRAWN
CAD
DATE
2021-JUNE
SCALE
1:50
SHEET NO.
AV-301



MULVEY & BANANI
AUDIO VISUAL

PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
SITE PLAN – AUDIO VISUAL

PROJECT NO.
20XXXX
DESIGNED
JC/GR
DRAWN
CAD
DATE
2021-JUNE
SCALE
1:250
SHEET NO.
AV–101

1 GENERAL

1.1 Care shall be exercised by the installer in wiring to avoid damage to cables and equipment. All AV and control cables required to complete the system described herein shall be supplied and installed by Division 27. The system integrator shall coordinate and supervise all wiring roughing. All joints and connections shall be made with new multi-core solder or with mechanical crimp connectors approved by the Consultant. All wiring shall be executed in strict adherence to professional broadcast practice and standards.

1.2 The integrator shall take all necessary precautions to prevent electromagnetic and electrostatic interference (hum, buzz, etc.) and the completed system shall be entirely free of noise of this nature.

1.3 All cables shall be clearly and permanently marked in a logical fashion at each end by means of a designation label, a numbered marker or other means approved by the Consultant. This identification scheme shall be correlated to the information on the wiring diagrams which are part of both the Shop and As-Built Drawing packages.

2 AUDIO DSP CONFIGURATION

2.1 The integrator shall provide a system configuration table, simple flow diagram and/or design for Owners representatives in advance of system programming. Consultant is to review and approve comments prior to the programming of the DSP. Include one (1) hour (4) hour DSP adjustment session with each system within the first twenty (30) days after final acceptance.

2.2 The DSP shall have but not be limited to the following programmatic requirements and features sets within the unit.

2.2.1 Microphone mixing for all inputs

2.2.2 Minimum three (3) band parametric equalizer for each microphone input

2.2.3 General mixing of system program sources (CD, Tuner, etc.)

2.2.4 Source muting of sources from input panel

2.2.5 Compressor / limiter for all handheld microphones (wired and wireless)

2.2.6 Minimum six (6) band parametric equalizer at output section for room equalization

2.2.7 Low-cut or high-pass filters at each input

2.2.8 Time alignment / delay of loudspeaker arrangements where required

2.2.9 Brick wall limiter for each output

2.2.10 Graphic User Interface shall include but not be limited to

- Level adjustment for program sources
- Master level control for microphone mute
- System Mute
- Preset for full occupancy of space
- Preset for low occupancy (<5 dB of "full" preset)
- Independent level of various amplifier channels and/or speaker circuits
- System "On"
- System "Off"

2.2.11 On completion of DSP programming, provide "as-built" system configuration drawings along with configuration files as part of the system manuals. All system files and parameters shall be released over to the Owner for future requirements, maintenance and system adjustments.

3 CABLE AND CONDUCTOR PREPARATION

3.1 All cables shall be prepared in such a way that the individual conductors, shield or drain insulation are not nicked or cut in any way. The cable outer jacket shall be cut square.

3.2 Insulations must be removed from conductor or bunch of conductors without strands that are not fully damaged to the extent that base metal shows through the plating and wire stripping method is the original lay, and are not combed out. The conductor's insulation shall be cut square within ½ of the outer diameter of the insulated conductor. If required, low conductor shall be tinned with a minimum amount used from solder with rosin flux.

4 CABLE DRESS

4.1 In general, cable dressing shall be consistent from a maintenance standpoint. Suitable service loops shall be provided to allow removal of equipment, or to extend equipment that is mounted in the rack on rack slides. Where there is no rear access to the rack mounted equipment, this requirement shall be carefully considered, and cabling shall be of sufficient length to enable the removal and replacement of any equipment item or module without disturbing other cables.

4.2 It is expected that the Contractor will fabricate racks and sub-assemblies off-site. Prewiring is acceptable provided that the prewired assembly can easily be transported to the job site without complication, and without risk of cable or equipment damage. Jury or demountable connections for inter-rack cables is not acceptable unless otherwise approved by the Consultant. Equipment connections as "future" shall be accommodated with cables installed and routed normally, with the unterminated end being labeled, sealed in a plastic bag, and tagged appropriately.

4.3 The Contractor shall be responsible for determining the proper length of all cables whether manufactured on or off the job site.

4.4 The Contractor shall determine the desired method of securing cables. All of the following requirements must be met by the system:

4.5.1 Plastic cable ties or hook-and-loop straps are the preferred method of cable lacing. Lace-in sections are not acceptable unless as approved in a particular cable tray.

4.5.2 Bares and cables shall be installed in a neat and orderly fashion, with like cable types fabricated and routed together. Groups of cables shall be neatly formed and harnessed. Harnessed groups of cables shall be anchored at suitable intervals to reduce and relieve wire stress, especially strain on connections. Adequate service loops shall be provided at all cable ends.

4.5.3 Where rack mounted equipment utilizes slide assemblies for front extension, slide in operation. For this type of mounting, additional, carefully dressed service loops on all cables shall be provided and installed with spring operated cable retractor assemblies to gather into recoil the service loop.

4.5.4 For all schemes of cable routing, no point in the path shall be subjected to a bend radius of less than eight (8) times the cable diameter or minimum cable bend radius specified by the manufacturer.

4.5.5 Fourteen cables shall not be used in such a manner as to prevent removal of the equipment to which they are applied.

4.5.6 Bares and cables shall be segregated according to signal type. In addition, audio cable shall be subdivided into three (3) classes: microphone level circuits, line level circuits, and speaker level circuits.

4.5.7 Microphone level audio circuits shall be kept at least 75mm (3") from any other type of parallel signal circuits and at least 150mm (6") from any parallel A.C. power circuits.

4.5.8 Speaker level audio circuits shall be kept a minimum of 75mm (3") from low level audio and AC power circuits. All other signal circuits shall be kept at least 75mm (3") away from any parallel AC power circuits. Where crossings occur, they shall be at right angles only for a distance of 300mm. Loops must be separated by a minimum of 75mm (3").

4.5.9 Where 2 circuits of different types must cross, they shall do so at right angles and lines return to the above required separations in as short a distance as possible.

4.5.10 Cable tie and bridle shall be accomplished using hook-and-loop type synthetically designed to supply proper tension to the cable tie, and to set the end off from with no protruding sharp edges. The Contractor's final supervisor shall spot check cable ties before the job is formally closed out for finish, thereby detecting any sharp edges of improperly cut cable ties. Install nylon ties on all inside runs of belt or above cabinet where are not supported by channels, raise tray, or other means. Place cable ties approximately six inches (6") apart. Do not use more cable ties than are necessary for a neat installation. Cable ties shall not be applied with excessive force which may damage or deform sensitive and fragile cables.

4.5.11 In the event that unshield cord cabling is used, cables must be grouped according to signal type, and shielded in the control facility, examination cable network designation to signal type such as braided nylon interlocked sleeving.

4.5.12 Rack mounting rails shall be used for cable lacing. Lacing bars and/or bar mount rails required for cabinets or console shall be provided where required. Provide appropriate and required vertical and horizontal lacing bars, wiring raceways and cable trays as necessary.

5 CABLE INSTALLATION

5.1 Cable ends shall be sealed before pulling to prevent moisture in the conduit from entering and damaging the cable.

5.2 Cable shall be pulled off the spool using an arbor to avoid twisting of cable.

5.3 Conduit shall be filled to 40% of section area for runs up to 15 metres (50 feet). Runs above 37 metres (150 feet) should be reduced to 30% or use larger size conduit.

5.4 A pull box shall be provided for conduit runs at each 30 metre (100 feet) interval and anywhere where conduit run bends exceed 180 degrees, within a given interval.

5.5 Cable shall be pulled so as not to exceed the cable's minimum allowable tension (typically less than 40% of tensile strength).

5.6 Cables shall not be allowed to be bent beyond the manufacturer's recommended bending radius.

5.7 Cables shall be pulled using gripping methods which distribute the stress evenly over the entire cable.

5.8 Cables shall be kept in a neated area until installation and shall not be pulled in conditions which would cause the cable to crack due to cold temperatures.

5.9 All cables shall be continuous between their terminated ends. Splices, junctions, connectors, etc. shall not be permitted between the ends of any cable unless noted by drawings or approved by the consultant prior to installation.

5.10 In situations where more than two cables will terminate at the output of a device, a breakout board complete with identification shall be provided near the device to gather the cables together that will result in only one cable actually terminating on the device. Furnish industry approved suitable harness blocks, marking and mounting systems. Exposed connections (cable at rack) shall include protective covering or enclosure. Where connections are exposed to moisture or corrosive environments, connections and terminations shall be housed and protected within sealed enclosures or by suitably approved protective sleeves or boots.

5.11 Cable pulling lubricants shall be non-corrosive and CSA approved for the type of cable used.

5.12 Cable pulling lubricants shall be soap in wax based, depending upon application. Use soap based for short runs and for form-constructing insulated wires, and wax based for long runs.

6 CABLE TERMINATION

6.1 Wire and cable termination shall be performed in accordance with Broadcast Industry Standards and the specifications of generally accepted installation practices.

6.2 With respect to audio equipment interconnections, the Contractor shall make every effort to use equipment with balanced inputs and outputs. When this is not possible, such as the case to most specialized, the following are recommended (in order of preference):

6.2.1 An electronic balancing device (professional interface) or balancing transformer should be utilized in the case of an unbalanced output driving a balanced input. Turnover referencing should be utilized. No active balances to unbalanced interconnect is not recommended.

6.3 It is ultimately the Contractor's responsibility to choose the best wiring practices to achieve optimal signal quality.

6.4 Wire and cable termination shall include all aspects of equipment connection, including, but not limited to, the following:

6.4.1 Wire and cable length

6.4.2 Protective jacket removal

6.4.3 Conductor separation, dressing and trimming

6.4.4 Conductor stripping

6.4.5 Connector device installation including, but not limited to, the following: Conductor termination, Shell assembly, Strain relief integration, Locking sleeving device installation

6.4.6 Cable designation shall be indicated on each distinct wire or cable, except where the colour code of pair number of individuals of pairs of 4 multi-pair eliminates the need for this. These shall be entered within five (5) inches of connectors, unless this interfered with disassembly of the connector. These shall be installed in such a manner as to be legible without unloosing any connections.

6.4.7 Continuity all inspection

6.4.8 Marking of connecting devices to equipment

6.5 It is the responsibility of the Contractor to determine and affirm the type and extended of all required mating connectors. Those manufacturers of equipment may exercise their right to make changes in connector types and wiring, it shall remain the responsibility of the Contractor to verify this aspect of the design prior to cable termination and installation.

6.6 Exposed portions of shield shall be protected with PVC heat shrinkable sleeving. Exposed ends of outer jackets on shielded cables shall be insulated with sleeves to eliminate the possibility of portions of the cut off foil shielded touching adjacent shields or metal. Clear rubber "Kabamaga" type sleeves or heat shrink sleeves shall be used. Raw shield drain wires shall be insulated with small diameter clear "sleeve or PVC" heat shrink (as appropriate) from under the sleeve to within 6mm (0.125 inch) of the point of termination.

7 CLEANING, MAINTENANCE AND EXTRA MATERIALS

7.1 All equipment and devices shall be presented by the Contractor to the Owner as new, crisp and unmarked condition.

7.2 Protective plastic shall be removed from all equipment prior to system start up and use.

7.3 All devices including but not limited to video projectors, cameras and speakers are to be properly adjusted for correct purpose and function.

7.4 Consumable materials, including Audio, Video and Control systems maintenance materials as well as any unused or duplicate materials to the Owner.

8 CONNECTORS

8.1 Only premium grade cable connectors shall be used. All cable mounted connectors shall be covered by a connector hood to shall have crimp ferrules which securely grasp the noise outer jacket to provide protection to the wire connections made on the connector and provide strain relief for the cable. All connectors shall have incorporated a mechanical means of attaching the connector to its mate to ensure that a connector will not fall off unless intentionally removed. Various connector requirements are present throughout the industry. All connection points shall be of industry standard and professional grade. All connectors shall have applicable screw relief and protective gasketing. Connectors in hostile environments such as high humidity shall require additional protective features.

8.2 Care shall be taken to ensure that the sleeves of gone mount connectors to not make contact with the mounting gone.

8.3 All required chassis mount connectors shall have rear shield and connection points and protective shielding on ground wire.

8.4 Where crimp connections are utilized, they shall be installed using the manufacturer's recommended corrosion cycle crimp tool that ensures that the proper crimp pressure has been applied. The Contractor shall develop a procedure to ensure that all crimp tools are properly checked for compliance with the manufacturer's standards, and that it is producing crimping-type connections within the required tolerances. The frequency of this depends on the usage and on the length of time a particular tool has to do operation.

8.5 Only premium grade cable connectors shall be used. Only pins and connectors of the proper size and design for the cable to which they are to be applied shall be used. There shall be no abnormal deformation of the contact during the crimping operation. There shall be no damage to the contact during the crimping operation that could interfere with its retention in its shell or its mating. There shall be no damage done to the conductor which either severs strands or weakens the conductor through loss of base metal by the crimping operation.

8.6 Only insulated crimp-on spade terminals shall be used for conduction to barrier strips. Multiple crimp lugs or ring lugs are not acceptable for this purpose. This is only applicable to stranded conductor wires. It is suggested that stranded conductor wire be "double dunk" on the crimp end prior to crimping. Solid conductors may be attached direct, to the barrier strip.

8.7 All conductors shall be stripped prior to installation underneath screws or barriers. Under the integrity control cable, solid conductor wire does not require crimp wire on stranded conductors all loose terminations and/or crimping shall be swapped to the same condition as screw retention during tightening (typically cockroach).

8.8 All soldered connections shall be clean with rosin flux shall be used. The solder shall be as manufactured by Kester, Ersin, or approved alternate, and shall be designed for electronic use. Solder fillets shall be smooth and flow around conductor and terminal. In no case shall the general outline of the conductor be visible in excessive solder. The insulation shall not be charred, melted or burned by the soldering operation. No final solder joint shall be bright and shiny and shall show no evidence of being a "cold" joint.

8.10 Mechanical connections must be terminated prior to soldering and be free of stress. Required to re-apply heat to wire, usually a single bend around solder ruined the joint. Should joints or multiple wraps on solder terminals, as that practice makes conductor removal very difficult after soldered.

9 GROUNDING PRACTICES

9.1 The AV system shall be serviced by electrical Ground which is defined as a ground benefit that is common to all building communications systems.

9.2 Due to the great number of various products utilized in the grounding system, it shall be the responsibility of the Contractor to follow good engineering practices as outlined below, to minimize crosstalk and to maximize signal-to-noise ratios in audio and video systems.

9.2.1 An equipment ground schemer will be maintained throughout the system. A ground loss bar will be provided by others for the exclusive use of the Contractor, for chassis and other building communication ground. This bus bar will serve as a termination point for all equipment and rack frame grounds and AC gather panel isolated ground connection. The Ground bus bar will be mounted to the vertical facility ground at one point only by others.

9.2.2 Each AV system equipment rack shall be connected to the Technical Power Ground bus bar via a dedicated #6 AWG (6mm) green insulated copper wire. System equipment racks shall be equipped from a dedicated #6 AWG (6mm) green insulated copper wire. System equipment racks shall be equipped from the AC power ground system. All contacts bolstering the equipment racks all be labeled from the connection point back to the equipment racks.

9.2.3 All racks in the equipment room shall be connected with a grounded AC outlet. Common Power Two (2) prong power cords will also have a fourteen (14) gauge green copper wire connection for the chassis to the grounded copper bus bar mounted to the equipment rack frame. Under no circumstances shall grounding prong of a (3) prong power cord be removed.

9.2.4 All audio cables' shields shall be connected to the ground at one point only. Exceptions may be made for proprietary equipment interfaces. This ground point shall be at the system or equipment rack destination circuit, which shall be attached to the system ground rack. For interconnect wiring this requires the shield to be connected at both ends, but grounded at only one end.

9.2.5 All wire receptacles shall be insulated from the mounting point, metal box, or wire way. Unless otherwise ordered, this shall be accomplished by using shoulder-type plastic receptacles. The Contractor shall exercise care to consumer ground references within each device and the grounding factors on site.

9.2.6 The Contractor shall take note that some specified equipment features transformerless balanced inputs and/or outputs and this equipment requires special attention to proper grounding techniques.

10 INSULATION DISPLACEMENT CONNECTIONS

10.1 Insulation displacement connections such as ribbon cables and telephone connector technology, shall only be installed with termination tooling as specified by the connector manufacturer. If shown in the connector manufacturer's data, No controlled-force crimp tool shall be selected. If the manufacturer has a multi-conductor mass-termination tool available, this shall be installed for all connections of ten pins or more.

10.2 Individual conductors of cables installed on terminal blocks shall not be stripped and shall be punched down with a spring loaded impact tool designed for this specific purpose. Bare cable conductors shall be insulated with Teflon, PVC heat shrink or other insulating sleeve (as appropriate) prior to being punched down on terminal block. During the punch down process, the tines and of the conductor shall be cut off, and the contractor shall ensure that this cut off shall is not left within the back of block assembly.

10.3 Only cables designed specifically for insulation displacement termination with the specific termination device employed shall be used.

11 REFERENCES + CODES AND STANDARDS

11.1 References Automatic

11.1.1 Abbreviations + Acronyms Handbook

11.1.2 Architectural Graphic Standards

11.1.3 Wiring in Audio Visual Detail Practices

11.2 Governing Bodies

11.2.1 The Audio Visual systems shall conform to the highest Quality standards. The following list does not in any way supersede all the industry organizations with published technical standards, and is not intended to be all-inclusive.

AES	Audio Engineering Society
EBU	European Broadcast Union
EIA	Electronic Industry Association
IEEE	Institute of Electrical and Electronic Engineers
ISO/IEC	International Standards Organization
NAB	National Association of Broadcasters
NEMA	National Electrical Manufacturers Association
NECA	National Electrical Contractors Association
NFPA	National Fireman Standards Committee
SMPTE	Society of Motion Picture and Television Engineers

12 SIGNAL TYPES

12.1 The signal type and classification in relation to an integrated audio visual and control systems. The Contractor shall adhere to and follow industry standards and protocols as established by organizations such as AES, SMPTE, ISSS, etc.

12.2 The Contractor shall provide the required controllers of professional quality and connection protocols as established by various industry organizations and regulatory bodies.

12.3 All signal type cables, interconnectors to adapters are to be clearly labeled on drawings. If not noted on AV system drawings the Contractor shall notify Consultant for clarification and direction.

12.4 Signal types shall be separated according to industry standards for signal type and level. Including, but not limited to: mic, line, audiospeech, video, control and power.

13 LIMIT OF INSTALLATION

13.1 The Contractor shall provide qualified, trained and professional installation technicians throughout the duration of the project.

13.2 During installation, the Contractor shall observe, understand and obey all site safety rules and regulations. Review all pertinent rules as they relate to proper protection in procedures must be adhered to.

13.3 The Audio Video and Control systems shall be installed as required in proper conduits. The Contractor shall provide all miscellaneous parts, hardware, and labour necessary to ensure complete and satisfactory operation of a fully functioning system.

13.4 All related wire, cable and conduit shall be of the correct type, quantity and size as specified or required by the manufacturer and accepted standards.

13.5 The Contractor shall gain consent from the Consultant especially project manager in order to begin installation.

13.6 All equipment, devices and subsidiary materials shall be in accordance with reasonable OEM and NEMA specifications, as well as be CSA/ULC approved.

14 SYSTEM SOFTWARE CONFIGURATION

14.1 The Contractor shall be responsible for providing a complete and working system in the premises of software programming.

14.2 Software programming shall be executed in the spaces of the Contractor's work. No portion may be carried from the issue of Contractor's work.

14.3 The Contractor shall supply system software as specified with the scope of work.

14.4 All software shall be registered and/or licensed in the name of the Owner.

14.5 All programming codes and configurations shall remain property in clear title of the Owner. This includes but is not limited to all source codes for audio and control systems and shall not be password protected in part or whole.

14.6 The said software shall be complete and operational as both the consultant and Owner prior to implementation.

14.7 The Contractor shall supply a complete set of system software and documentation as follows:

14.7.1 In the case of commercial software, a complete set of software, including the license and documentation for all devices, drives, and tools used in the operation and maintenance of the audio visual / AV system.

14.7.2 In the case of non-commercial or custom software, a complete set of software is required, including human (1 hard copies) and documentation for all devices, utilities, and tools used in the operation and maintenance of the audio visual / AV system. Documentation shall be presented in such a way as to allow the Owner the ability to perform unspecified operation, maintenance, troubleshooting and programming.

15 TESTING AND COMMISSIONING

15.1 General

15.1.1 Perform site testing only after all equipment is installed and fully operational.

15.1.2 Submit all test results for Consultant's review.

15.1.3 All equipment or systems otherwise identified for site testing manufacturers shall be contracted by the Contractor prior to obtaining a "Certificate of Substantial Completion".

15.1.4 The Contractor shall provide ensemble all required test equipment during commissioning, including any necessary software appropriate material to the calibration and configuration of required equipment. Prior to substantial completion, the Owner may require use of the system for testing purposes. The Contractor shall not have any responsibility because of this temporary use of the facilities and it shall not be considered as evidence of acceptance.

15.1.5 Verify labeling integrity, i.e., continuity of each conductor, correctness of pair polarity terminations, non-existence of shorts between conductors, to conductors and Shield, and the proper operation of junction block assemblies.

15.1.6 After the system is complete and final adjustments have been made, provide the Consultant with properly and accurately completed data regarding the performance of the system. Include a listing, as constructed instructions, as well as block diagrams and descriptions outlining the adjustment procedures.

15.1.7 Submit with the test results, written certification that the system is complete and meets these specifications and is ready for final inspection.

15.1.8 All installed cables and terminations shall meet or exceed the minimum specifications of the manufacturers. Any defects or terminations failing to meet these specifications shall be promptly corrected.

15.1.9 All defects and failures to meet warranty or baseline standard during the warranty period shall be repaired or replaced without additional expense to the Owner within 5 (three) working days. All such work shall be performed at a time which is acceptable to the owner.

16 TESTING ACCEPTANCE

16.1 Upon completion of all testing, system troubleshoots and tuning programming, the Contractor shall demonstrate the system's performance to the consultant and Owner representative(s). Demonstrate the system's operation and functionality as outlined and detailed in final specification. This as one final equipment necessary for the acceptance tests.

16.2 Witness acceptance tests shall be conducted to test system to ascertain during the compliance testing. The Contractor shall continue to do work until the system is approved by the consultant.

16.3 Any deficiencies reported during acceptance testing shall be rectified within 5 working days or otherwise noted during the acceptance testing.

16.4 The Contractor shall perform additional work with acceptance and expense of system without extra cost to the contract.

17 TRAINING

17.1 The Contractor shall be responsible to provide training sessions to individualities named by the Owner as outlined by the training models and quantities defined below.

17.1.1 End user training: Provide a minimum of two (2) training sessions of no less than two (2) hours each. A minimum of one (1) training session shall occur prior to the final acceptance of the system. Scope shall include instruction for system operation and basic troubleshooting.

17.1.2 Technical training: Provide a minimum of two (2) training sessions of no less than two (2) hours each. A minimum of one (1) training session shall occur prior to the final acceptance of the system. Scope shall include instruction for system operation, advanced troubleshooting and system reconfiguration.

17.2 A training agenda shall be submitted to both the Owner and Consultant for review in advance of the scheduled training session as part of the co-ordination effort.

17.3 A draft summary of curriculum shall be provided during the training session to all attendees at the training session.

17.4 The final operations guide shall be provided as part of the manual as specified under Operation and Maintenance Manuals.

MULVEY & BANANI
AUDIO VISUAL
50 Sheppard Avenue East, Suite 900, Toronto, ON M2N 5W5
416.217.1339 | 866.782.6264

DRAWING ISSUE RECORD

1 22-02-11 ISSUED FOR TENDER

PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
AUDIO VISUAL SPECIFICATION
SECTION 27 41 16
AUDIO VISUAL SYSTEMS

INSTRUCTION
22/02/28

DESIGNED
JC/GR

DRAWN
CAD

DATE
2021-JUNE

SCALE
N.T.S.

SHEET NO.
AV-003

SAULT STE. MARIE DOWNTOWN PLAZA

AUDIO VISUAL DRAWINGS
ISSUED FOR TENDER

DRAWING LIST

AV-001 AUDIO VISUAL LEGEND, DRAWING LIST & GENERAL NOTES
AV-002 AUDIO VISUAL SPECIFICATION SECTION 27 41 00 AUDIO VISUAL GENERAL REQUIREMENTS
AV-003 AUDIO VISUAL SPECIFICATION SECTION 27 41 16 AUDIO VISUAL SYSTEMS
AV-101 SITE PLAN - AUDIO VISUAL
AV-201 SERVICE DIVISION BREAKDOWN - AUDIO VISUAL SYSTEMS
AV-401 AUDIO VISUAL FUNCTIONAL DIAGRAM
AV-402 AUDIO VISUAL FUNCTIONAL DIAGRAM
AV-501 AUDIO VISUAL INTERCONNECTING VIDEO
AV-701 AUDIO VISUAL DETAILS
AV-702 AUDIO VISUAL DETAILS

AUDIO VISUAL LEGEND

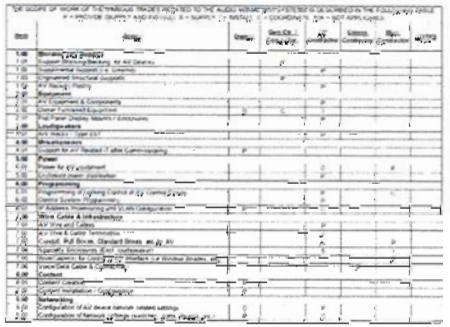
SYMBOL	DESCRIPTION
	CEILING MOUNT LOUDSPEAKER "X" DENOTES LOUDSPEAKER TYPE "Y" DENOTES LOUDSPEAKER WATTAGE 5W
	WALL MOUNT LOUDSPEAKER "X" DENOTES LOUDSPEAKER TYPE "Y" DENOTES LOUDSPEAKER WATTAGE 5W
	WALL MOUNT DISPLAY MONITOR "X" DENOTES DISPLAY TYPE "Y" DENOTES DISPLAY MOUNT TYPE
	EQUIPMENT RACK "X" DENOTES RACK TYPE "Y" DENOTES RACK U SIZE
	WALL MOUNT AUDIO/VISUAL DEVICE LOCATION "X" DENOTES AV TYPE ID
	DESK/TABLE SECTION MOUNT AUDIO/VISUAL DEVICE LOCATION "X" DENOTES AV TYPE ID

GENERAL NOTES

1. GENERAL NOTES
1.1 AUDIO VISUAL CONTRACTOR SHALL REVIEW ALL DRAWINGS AND NOTIFY THE CONSULTANT SHOULD ANY DISCREPANCIES ARISE.
1.2 PROVIDE 6" PIGTAIL LOOPS FOR EACH CABLE AND TERMINATE WITH FINAL CONNECTION TO DEVICE FUNCTIONS REQUIRED BUT NOT LIMITED TO AUDIO, VIDEO, CONTROL AND NETWORK SIGNALS UNLESS OTHERWISE NOTED.
1.3 AV CONTRACTOR SHALL COORDINATE EXACT POWER, DATA AND BACK BOX LOCATIONS FOR DISPLAY MONITOR AND MOUNT CONFLICTS.

2. REFERENCE DOCUMENTS
2.1 REFER TO ARCHITECTURAL DRAWINGS FOR DETAILING.
2.2 REFER TO ELECTRICAL DRAWINGS FOR POWER LOCATIONS AND DETAILS.
2.3 REFER TO COMMUNICATIONS DRAWINGS FOR DATA LOCATIONS AND DRAWINGS.

DIVISION OF RESPONSIBILITY



MOLVEY & BANANI
AUDIO VISUAL

2 24-02-11 ISSUED FOR TENDER
1 23-09-12 ISSUED FOR DCS CD

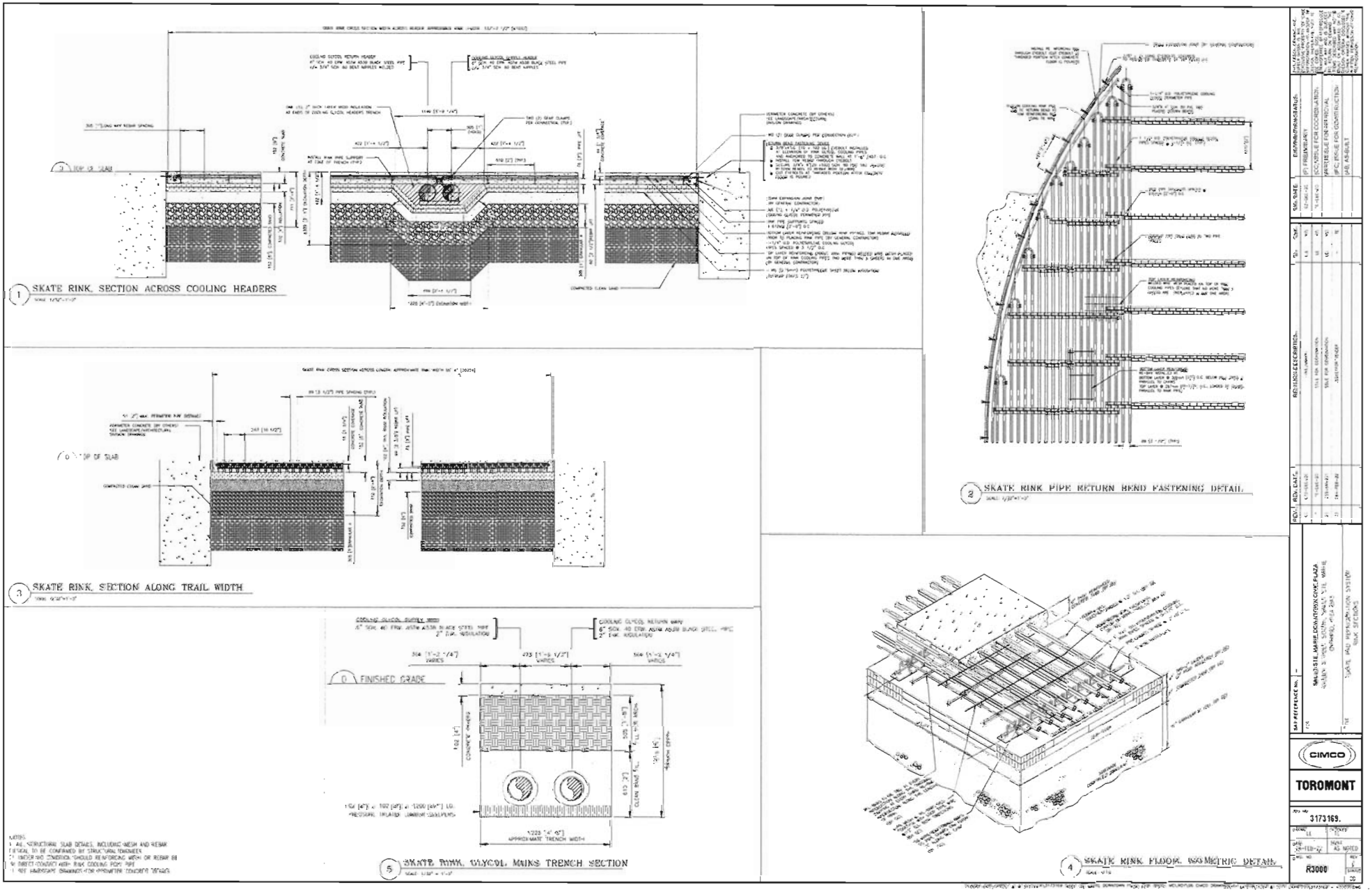
PROJECT
SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

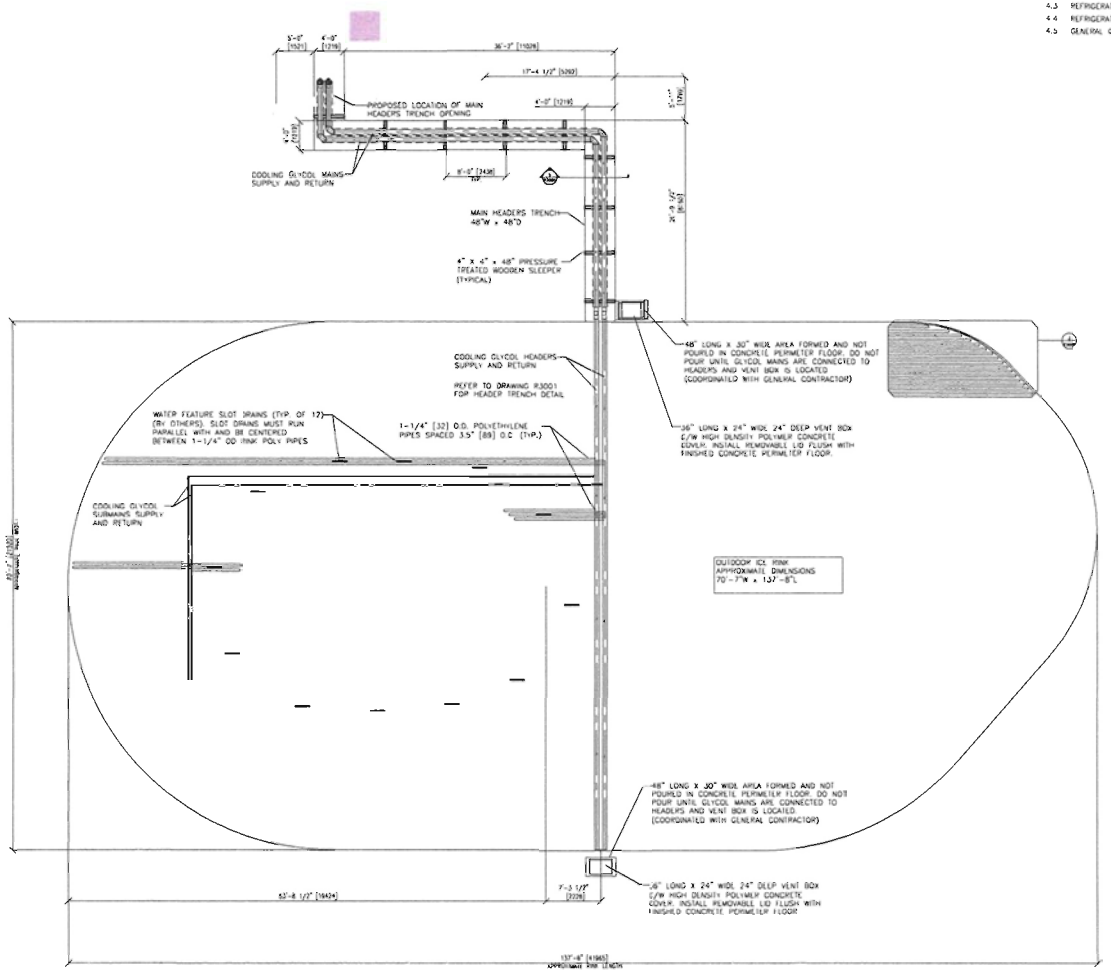
SHEET TITLE
AUDIO VISUAL LEGEND, DRAWING LIST & GENERAL NOTES

PROJECT NO.
20UP29
DESIGNED
JC/SR
DRAWN
CAD
DATE
2024 JUNE
SCALE
N.T.S.
DRAWING NO.
AV-001


1 SKATE RINK, SECTION ACROSS COOLING HEADERS
2 SKATE RINK PIPE RETURN BEND FASTENING DETAIL
3 SKATE RINK, SECTION ALONG TRAIL WIDTH
4 SKATE RINK FLOOR, ISOMETRIC DETAIL
5 SKATE RINK, GLYCOL MAINS TRENCH SECTION
TOROMONT
CIMCO
3173169.
R3000

NOTES:

1. BURIED GLYCOL PIPING TO BE PRESSURE TESTED WITH 75 PSIG AIR OR WATER AND LEAK TESTED PRIOR TO INSULATING OR PAINTING
2. ALL BURIED GLYCOL MAINS & HEADERS TO BE FINISHED WITH TWO COATS EPOXY PAINT PRIOR TO COVERING WITH INSULATION & JACKETING
3. GENERAL CONTRACTOR TO EXCAVATE, BACKFILL AND COMPACT TRENCHES USING NON-ORGANIC FILL
4. VENT BOX INSTALLATION PROCEDURE
   - 4.1 GENERAL CONTRACTOR TO FORM VENT BOX INSTALLATION SPACE AS SHOWN
   - 4.2 AFTER THE COOLING GLYCOL HEADERS ARE CONNECTED TO BURIED MAINS AND THE RINK FLOOR IS PRESSURIZED AND LEAK TESTED, GENERAL CONTRACTOR TO BACK FILL UNPOURED AREA USING SPECIFIED FILL
   - 4.3 REFRIGERATION CONTRACTOR TO INSTALL ACCESS BOXES AND LEVEL TO SUIT
   - 4.4 REFRIGERATION CONTRACTOR TO INSTALL AND SECURE PURGE VALVES INSIDE ACCESS BOXES
   - 4.5 GENERAL CONTRACTOR TO FILL AND FINISH PERIMETER SLAB TO SUIT



1 / R2005 **MAINS AND HEADERS LAYOUT**
1/8" = 1'-0"

REV.	REV. DATE	REVISION DESCRIPTION	BY	CHK
3	24-FEB-22	ISSUE FOR TENDER	TC	-
2	10-DEC-21	ISSUE FOR COORDINATION	TC	VS
1	29-JAN-21	ISSUE FOR COORDINATION	TC	VS
0	23-JAN-21	UPDATED FOR 50% COORDINATION	TC	VS
3	23-JAN-21	ADDED HEADERS AND ADDED NOTE TO REFERENCE NEW HEADER SLOT DRAWS	TC	CG
4	08-JAN-21	REVISED HEADERS AND ADDED NOTE TO REFERENCE NEW HEADER SLOT DRAWS	TC	CG

DATE: 24-FEB-22 | SCALE: 1/8", 1'-0" | DWG. NO: R2005 | REV: 3 | DRAWN: TC | CHECKED: CG

JOB NO: 3173169

CIMCO REFRIGERATION

TORONTO

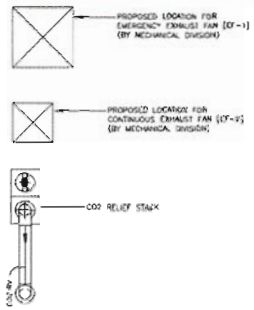
SAULT STE. MARIE DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH, SAULT STE. MARIE ONTARIO, P6A 2A3

SHEET TITLE: SAULT PAD REFRIGERATION SYSTEM
COOLING GLYCOL MAINS AND HEADERS LAYOUT

SAP REFERENCE No.: -

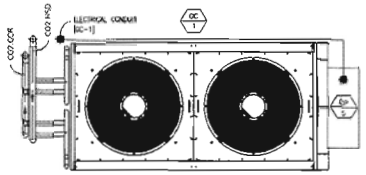
COSTAIN/JACKS STAMP: (PT) PRELIMINARY 22-DEC-20; (ICD) ISSUE FOR COORDINATION 16-DEC-20; (AFC) ISSUE FOR APPROVAL; (IFC) ISSUE FOR CONSTRUCTION; (AS) AS-BUILT

This drawing and design is the property of CIMCO REFRIGERATION and is not to be used in whole or in part for any purpose other than that for which it is supplied. Permission to use, copy or reproduce must be obtained from CIMCO REFRIGERATION



ROOF CONES BY OTHERS
ROOF / WALL PENETRATIONS BY OTHERS

Refrigeration Room Roof Level



GAS COOLER SUPPORT STAND
DESIGNED BY STRUCTURAL DIVISION
PROVIDED BY STRUCTURAL DIVISION / CONTRACTOR

STAND TO RAISE COOLER MINIMUM 4'-0" ABOVE INTER OGGIONATE TOP OF GAS COOLER FANS WITH ADJACENT ROOF AND WALLS

1 R2004

MECHANICAL ROOM ROOF PIPING LAYOUT

1/2"=1'-0"

PLAZA

DISTRIBUTION STATUS

DATE	
13-DEC-22	(01) PRELIMINARY
14-DEC-22	(02) ISSUE FOR COORDINATION
	(VPP) ISSUE FOR APPROVAL
	(IFC) ISSUE FOR CONSTRUCTION
	(AS) AS-BUILT

REV	DES	CHK
0	AA	XX
1	AA	XX
2	AA	XX
3	AA	XX
4	AA	XX

REVISION/DESCRIPTION

REV	DES	DATE
0	AA	14-DEC-22
1	AA	21-JAN-23
2	AA	03-MAR-23
3	AA	24-FEB-23
4	AA	24-FEB-23

0 - ISSUE FOR COORDINATION
1 - ISSUE FOR COORDINATION
2 - REVISED LOCATION OF GAS COOLER AND PIPING
3 - ISSUE FOR TENDER
4 - ISSUE FOR TENDER

SAP REFERENCE No: -

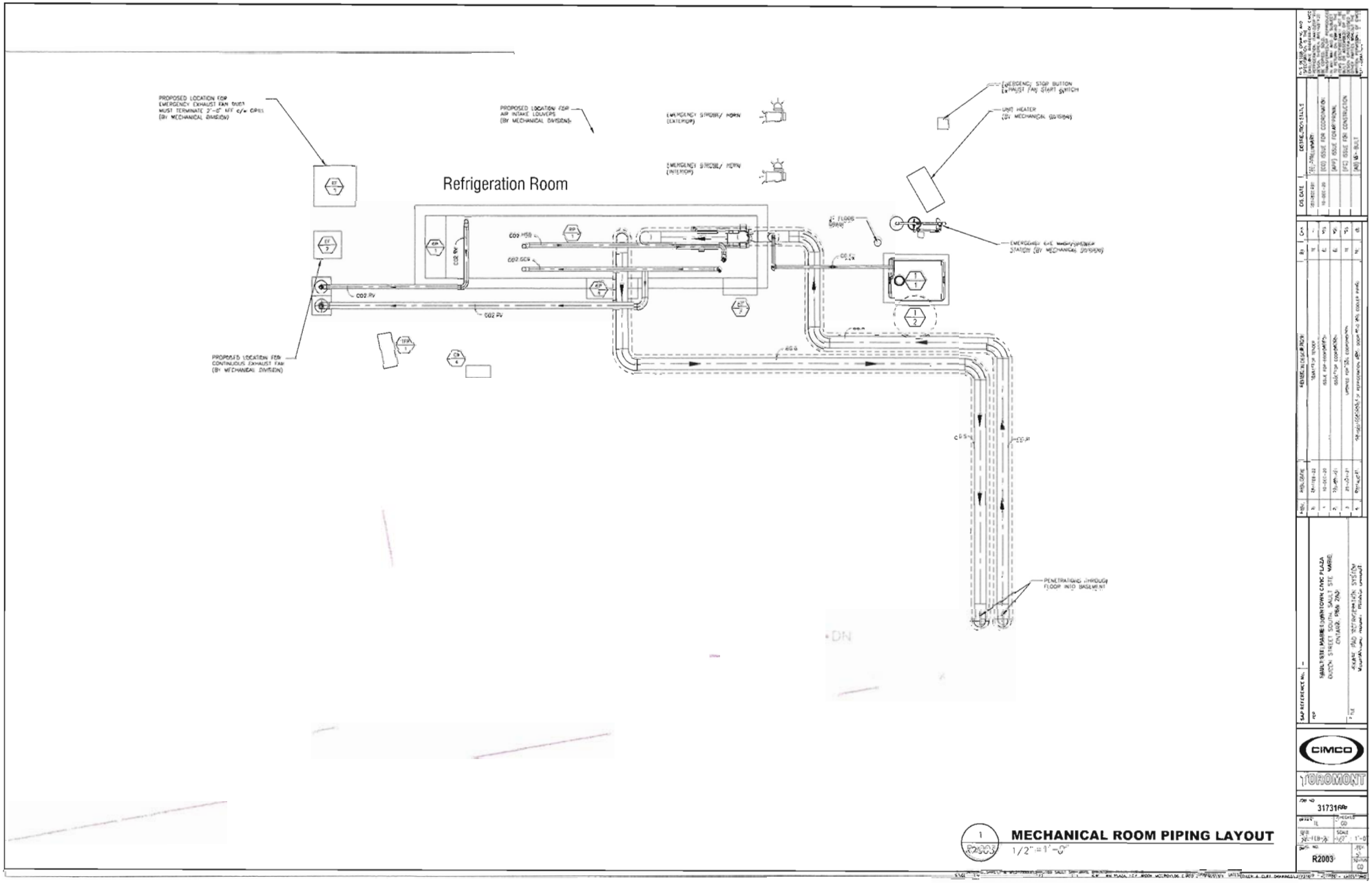
SAULT STE. MARIE DOWNTOWN CIVIC PLAZA
CLEEH STREET SOUTH, SAULT STE. MARIE, ONTARIO, P6A 2A3

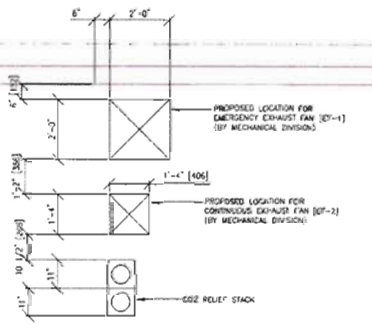
SUBJECT: SKATE PAD REFRIGERATION SYSTEM
MECHANICAL ROOM ROOF PIPING LAYOUT

CIMCO
TOROMONT

JOB No.: 3173169

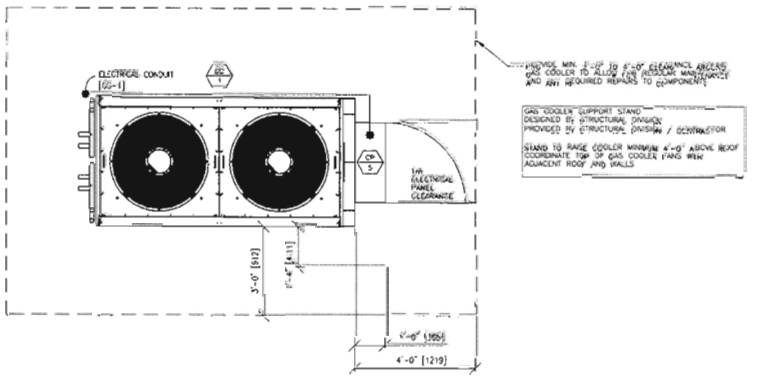
DRAWN	CHECKED
RC	CD
DATE	SCALE
24-FEB-23	1/2" = 1'-0"
DWG No.	REV
R2004	4
	STATUS: CD


PROPOSED LOCATION FOR EMERGENCY EXHAUST FAN DUCT MUST TERMINATE 2'-0" AFF c/w GRILL (BY MECHANICAL DIVISION)
PROPOSED LOCATION FOR AIR INTAKE LOUVERS (BY MECHANICAL DIVISION)
EMERGENCY STROBE/ HORN (EXTERIOR)
EMERGENCY STROBE/ HORN (INTERIOR)
EMERGENCY STOP BUTTON EXHAUST FAN START SWITCH
UNIT HEATER (BY MECHANICAL DIVISION)
Refrigeration Room
6" FLOOR DRAIN
EMERGENCY EYE WASH/SHOWER STATION (BY MECHANICAL DIVISION)
CO2 HSR
CO2 SCR
CO2 PV
CO2 PV
CO2 PV
PROPOSED LOCATION FOR CONTINUOUS EXHAUST FAN (BY MECHANICAL DIVISION)
PENETRATIONS THROUGH FLOOR INTO BASEMENT
MECHANICAL ROOM PIPING LAYOUT
1/2" = 1'-0"
R2003
CIMCO
TOROMONT
31731
R2003



ROOF CONES BY OTHERS
ROOF / WALL PENETRATIONS BY OTHERS

Refrigeration Room Roof Level



1 / R2002 MECHANICAL ROOM ROOF EQUIPMENT LAYOUT

1/2"=1'-0"

■ 3/60/575v POWER (BY ELECTRICAL DIVISION)

CO2 GAS COOLER (GC-1):
- MANUFACTURER/MODEL: GUNTNER GGFW 060
- TYPE AIR COOLED, DRY GAS
- FAN MOTORS: TWO (2) 5.9HP, 480V/3/60 c/w SPEED CONTROLLER & TEMP SENSOR
- CAPACITY: 707 MBH (58.9 TR)
- DESIGN PRESSURE: 1740 PSIA
- GRN: TBD
- EQUIPMENT DRAWING: TBD
- DIMENSIONS: 10'-7"L x 4'-7"W x 5'-7"H
- OPERATING WEIGHT: 2,145 LBS

NOTES:

THE FOLLOWING ITEMS ARE REQUIRED FOR THE OPERATION OF THE REFRIGERATION SYSTEM AND ARE TO BE PROVIDED BY THE GENERAL CONTRACTOR UNLESS OTHERWISE NOTED:

GENERAL CONTRACTING & STRUCTURAL:

GAS COOLER STRUCTURAL STEEL SUPPORT
- QUANTITY: (1) ONE
- TO BE SIZED BY STRUCTURAL DIVISION
- TOP OF GAS COOLER FANS TO BE AT SAME ELEVATION AS TOP OF ENCLOSURE

CONCRETE HOUSEKEEPING PADS
- REINFORCING STEEL REQUIREMENTS BY STRUCTURAL DIVISION

PENETRATIONS
- ROOF OPENINGS & WALL PENETRATIONS REQUIRED FOR PIPE INTERCONNECTION AS SHOWN ON DRAWINGS R2003 & R2004

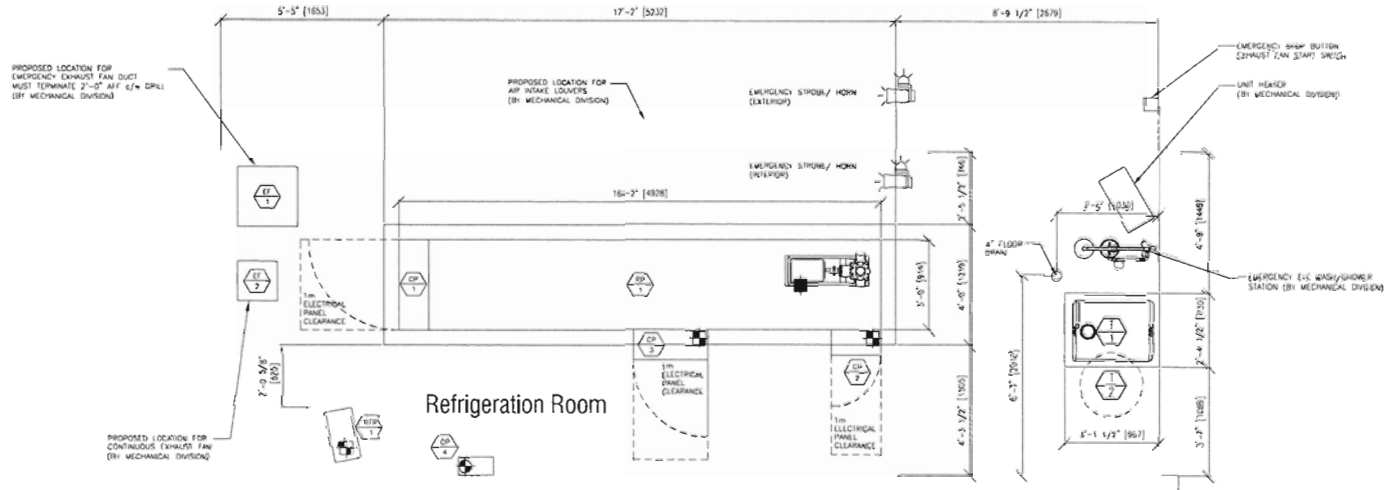
ELECTRICAL:
- 3/60/575 VOLT, ELECTRICAL SERVICE AND WIRING FROM THE GAS COOLER TRANSFORMER (TRSF-1) DISCONNECT SWITCH LUGS
- ROOM EXHAUST FAN SYSTEM WIRING & STARTER PANEL AND ROOM THERMOSTAT
- ALL ELECTRICAL CONDUIT TO BE SIZED TO COMPLY WITH LOCAL POWER COMMISSION AND CSA CODES
- MINIMUM CONDUIT SIZE TO BE 3/4"

MECHANICAL & PLUMBING:

PLUMBING DRAINS:
- 4" ROOF DRAIN LOCATED NEAR GAS COOLER: QUANTITY: (1) ONE

MECHANICAL VENTILATION:
- EMERGENCY VENTILATION SYSTEM CAPACITY SHALL BE CALCULATED AS PER CSA B52 FOR 385 LB CO2 CHARGE
- MINIMUM VENTILATION IS REQUIRED AS PER CSA B52
- EXHAUST FAN WITH STARTER & VFD CONTROL
- EXHAUST FAN INTERLOCK WIRING TO CO2 LEAK DETECTOR PANEL
- EXHAUST DUCT SHOULD BE LOCATED 2' ABOVE THE FLOOR AS CO2 IS HEAVIER THAN AIR AND IT WILL SINK TO THE BOTTOM.
- FRESH AIR INLET LOUVRE WITH MOTORIZED DAMPER

CIMCO
TOROMONT
JOB NO. 3173169
DRAWING R2002



1 / R2001 **MECHANICAL ROOM EQUIPMENT LAYOUT**

1/2"=1'-0"

- 1/60/120V POWER (BY ELECTRICAL DIVISION)
- 3/60/575V POWER (BY ELECTRICAL DIVISION)
- POWER BY REFRIGERATION CONTRACTOR

CO2/GLYCOL REFRIGERATION PACKAGE (RP-1):
- MANUFACTURER: CARNOT REFRIGERATION
- CAPACITY: 40 TR ICE RINK LOAD
- 40% ETHYLENE GLYCOL AT 13°F RINK SUPPLY
- DIMENSIONS: 12'-2" L x 3'-0" W x 6'-8" H
- POWER: 575v/3PH/60Hz
- EQUIPMENT DRAWING: TBD
- PIPING FLOW DIAGRAM: TBD
- OPERATING WEIGHT: APPROX. 7,500 LB

NOTES:

THE FOLLOWING ITEMS ARE REQUIRED FOR THE OPERATION OF THE REFRIGERATION SYSTEM AND ARE TO BE PROVIDED BY THE GENERAL CONTRACTOR UNLESS OTHERWISE NOTED:

GENERAL CONTRACTING & STRUCTURAL:

GAS COOLER STRUCTURAL STEEL SUPPORT
- QUANTITY: (1) ONE
- TO BE SIZED BY STRUCTURAL DIVISION
- TOP OF GAS COOLER FANS TO BE AT SAME ELEVATION AS TOP OF ENCLOSURE

CONCRETE HOUSEKEEPING PADS
- REINFORCING STEEL REQUIREMENTS BY STRUCTURAL DIVISION

PENETRATIONS
- ROOF OPENINGS & WALL PENETRATIONS REQUIRED FOR PIPE INTERCONNECTION AS SHOWN ON DRAWINGS R2003 & R200H

ELECTRICAL:
- 3/60/575 VOLT. ELECTRICAL SERVICE AND WIRING FROM THE GAS COOLER TRANSFORMER (TRSF-1) DISCONNECT SWITCH LUGS
- ROOM EXHAUST FAN SYSTEM WIRING & STARTER PANEL AND ROOM THERMOSTAT
- ALL ELECTRICAL CONDUIT TO BE SIZED TO COMPLY WITH LOCAL POWER COMMISSION AND CSA CODES
- MINIMUM CONDUIT SIZE TO BE 3/4"

MECHANICAL & PLUMBING:

PLUMBING DRAINS:
- 4" ROOF DRAIN LOCATED NEAR GAS COOLER: QUANTITY: (1) ONE

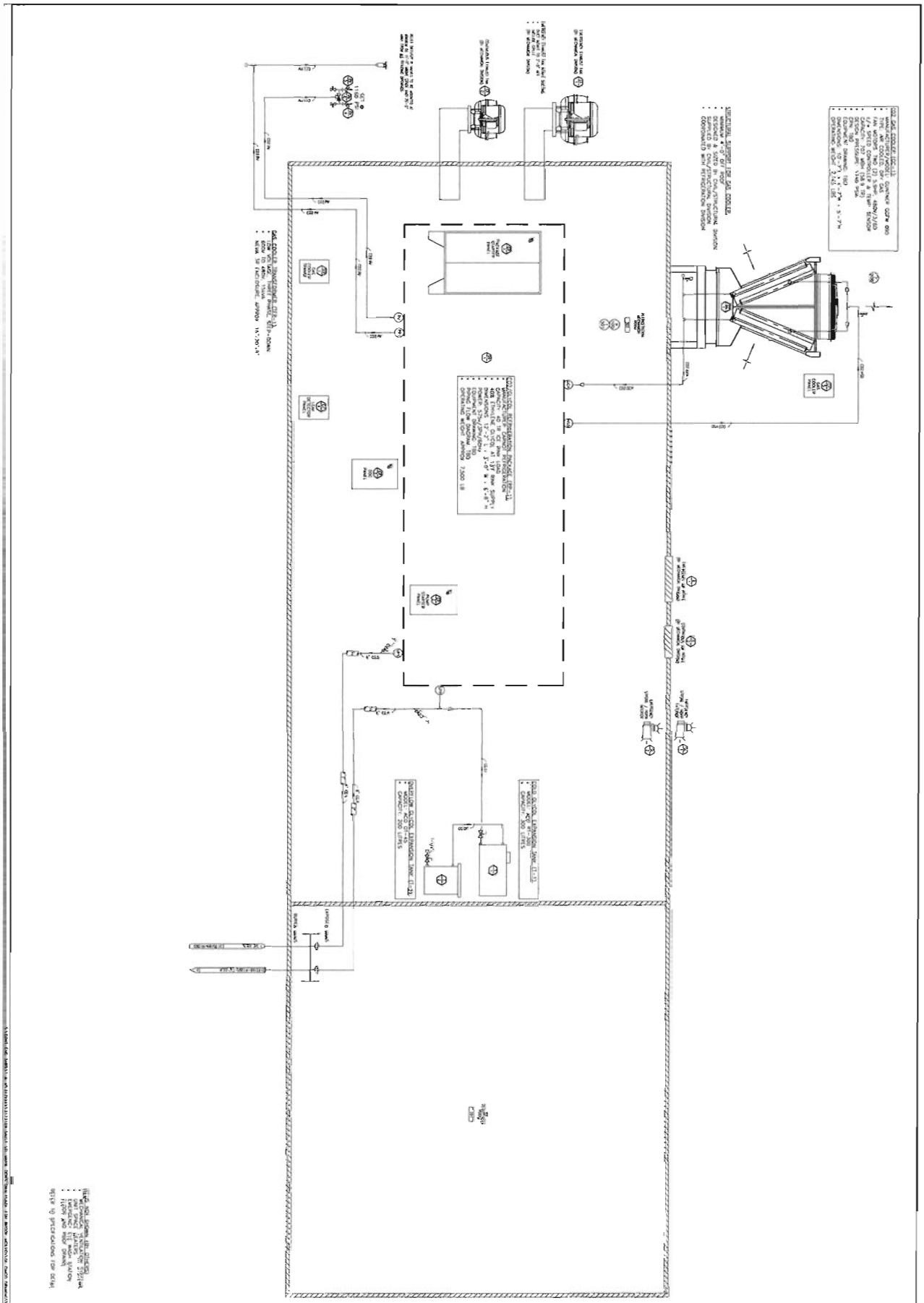
MECHANICAL VENTILATION:
- EMERGENCY VENTILATION SYSTEM CAPACITY SHALL BE CALCULATED AS PER CSA B52 FOR 385 LB CO2 CHARGE
- MINIMUM VENTILATION IS REQUIRED AS PER CSA B52
- EXHAUST FAN WITH STARTER & VFD CONTROL
- EXHAUST FAN INTERLOCK WIRING TO CO2 LEAK DETECTOR PANEL
- EXHAUST DUCT SHOULD BE LOCATED 2' ABOVE THE FLOOR AS CO2 IS HEAVIER THAN AIR AND IT WILL SINK TO THE BOTTOM.
- FRESH AIR INLET LOUVRE WITH MOTORIZED DAMPER

SAULT STE MARIE DOWNTOWN COMPLEX PLAZA
ZZUBEK STREET SOUTH, SAULT STE. MARIE ONTARIO, P6A 2X3

CIMCO REFRIGERATION DIVISION
TORONTO

3173169

R2001



SAP REFERENCE No.	–
FOR	SAULT STE. MARIE DOWNTOWN CIVIC PLAZA CLARA STREET SOUTH, SAULT STE. MARIE, ONTARIO, P6A 2X5
TITLE	SKATE PAD REFRIGERATION SYSTEM EQUIPMENT & PIPING FLOW DIAGRAM (1 OF 2)

REV.	REVISION DATE	REVISION DESCRIPTION	BY	TYPE
0	16-OCT-20	ISSUED FOR PRELIMINARY	VOS	
1	18-NOV-20	ISSUE FOR COORDINATION	VOS	
2	20-JAN-21	ISSUE FOR COORDINATION	VOS	
3	24-FEB-21	ISSUE FOR TENDER	VC	

DRAWING STATUS	DESCRIPTION
(PF) PRELIMINARY	
(CO) ISSUE FOR COORDINATION	
(APP) ISSUE FOR APPROVAL	
(FC) ISSUE FOR CONSTRUCTION	
(AB) AS-BUILT	

THIS DRAWING, DRAWING AND SPECIFICATION, IS THE EXCLUSIVE PROPERTY OF CIMCO REFRIGERATION. IT AND/OR ITS DESIGN THEREON ARE NOT TO BE COPIED, SOLD, TRANSFERRED OR REPRODUCED IN ANY WAY AND IS SUBJECT TO RETURN ON DEMAND. THIS DRAWING IS NOT TO BE USED OR PART OF ASSEMBLED OR ITS DESIGN CRITERIA DISCLOSED TO OTHER PARTIES WITHOUT THE WRITTEN PERMISSION OF CIMCO REFRIGERATION.

R1001 | 3173169

GENERAL NOTES AND SPECIFICATIONS

A) PIPING FLOW DIAGRAM LEGEND:

1) ———— , REFRIGERATION SYSTEM PIPING
2) ———— , FUTURE PIPING
3) – – – – , INTERNAL VESSEL OR TANK PIPING
4) ———— , PIPING NOT INCLUDED SCOPE OF WORK
5) [4000MM | 3" NPS] ——▷— PIPE TAG
———— REFERENCE DRAWING FOR CONTINUATION OF PIPING
6) ● , PACKAGE CONNECTION
7) DRAWING SYMBOLS:

AMMONIA VALVES	WATER/ GLYCOL VALVES	TAGS & INSTRUMENTATION
GLOBE, SEAL CAP	BALL, NORM. OPEN	EQUIPMENT TAG
GLOBE, HAND WHEEL	BALL, NORM. CLOSED	MOTOR HORSEPOWER
ANGLE, SEAL CAP	BUTTERFLY	LOW VOLTAGE INSTRUMENTATION
HAND EXPANSION	GATE	VALVE TAGS
SOLENOID	ACTUATED BALL	INSULATION THICKNESS
MOTORIZED	3-WAY ACTUATED BALL	HEAT TRACING
GAS POWERED	CHECK VALVE	LEVEL SWITCH
GAS POWERED-DUAL, 2 STEP	BALANCING	THERMOMETER
PRESSURE REGULATOR	WATER METER	PRESSURE GAUGE
THERMO. EXPANSION	AIR SCOOP	PRESS. TRANSDUCER W/ STEAM-MOUNT
STRAINER	AUTO AIR VENT	
CHECK	FILTER	
RETURN SPRING CLOSE	MULTI-PORT VALVE	
PRESSURE RELIEF		
LIQUID DRAINER		
NEEDLE BLOCK VALVE		

B) REFRIGERATION SYSTEM CLASSIFICATION:

1) CLASSIFICATION OF SYSTEM: INDIRECT
2) CLASSIFICATION OF OCCUPANCY: PUBLIC ASSEMBLY
3) CLASSIFICATION OF REFRIGERANT: GROUP A1, R744 (CARBON DIOXIDE)
4) REFRIGERATION SYSTEM DESIGN CONDITIONS:

CO2 SYSTEM	SYSTEM PRESSURES: DESIGN	OPERATING	TEST (MIN.)	SATURATION TEMP. (DEW/MIDDLE)
HIGHSIDE, TEMP. = 75°F [23.89°C]	1,740 psig [11,997 kPa]	897 psig [6185 kPa]	1,740 psig [11,997 kPa]	+10/266 °F [-25/129 °C]
LOWSIDE, TEMP. = 53°F [+11.67°C]	1,160 psig [7,998 kPa]	310 psig [2137 kPa]	1,160 psig [7,998 kPa]	-30/208 °F [-34/93 °C]

C) REFRIGERATION SYSTEM PIPING TEST:

1) ALL NEW PIPING TO BE PRESSURE TESTED PRIOR TO INSULATING OR PAINTING
2) TYPE OF TEST: NITROGEN
3) REFRIGERANT PIPING AND VESSELS TO BE PRESSURE TESTED TO TEST PRESSURE AS SHOWN

D) REFRIGERATION SYSTEM REFRIGERANT CHARGES:

1)

[illegible] REFRIGERANT	PURITY	MASS (LBS)	MASS (KGS)
CO2 (R-744)	99.9 %	350	175

2)

SYSTEM	SECONDARY REFRIGERANT	CONCENTRATION BY WEIGHT	FREEZE POINT	SYSTEM VOLUME	PIPING VOLUME	MAX. FILL QUANTITY
MAKE-FILL (SODIUM)	ETHYLENE GLYCOL	40% BY WT.	-24°F	1750	450lbs	1300

E) REFRIGERATION SYSTEM PIPING:

1) REFRIGERATION PIPING TO CONFORM TO CSA B52-13 MECHANICAL REFRIGERATION CODE
2) ALL REFRIGERANT PIPE FITTINGS SHALL HAVE VALID CRN NUMBER, MANUFACTURER'S IDENTIFICATION AND CONFORM TO THE FOLLOWING SPECIFIED STANDARDS:

CO2 SYSTEM - STAINLESS STEEL PIPING		
SIZE	TYPE	MATERIAL
2-1/2" TO 3" NPS	PIPE	SCH 40S, ASTM A312 TYPE 304 OR 316 SMLS STAINLESS STEEL
	FITTING	3000 LB, ASTM A182 TYPE 304 OR 316 SS, SOCKET WELD
4" NPS	PIPE	SCH 40S, ASTM A312 TYPE 304 OR 316 SMLS STAINLESS STEEL
	FITTING	3000 LB, ASTM A182 TYPE 304 OR 316 SS, SOCKET WELD
1-1/2" NPS & SMALLER	PIPE	SCH. 10S, ASTM A312 TYPE 304 OR 316 SMLS STAINLESS STEEL
	FITTING	3000 LB, ASTM A182 TYPE 304 OR 316 SS, SOCKET WELD 2000 LB, ASTM A182 TYPE 304/316 SS; THREADED ONLY ON 3/4" AND SMALLER ONLY WHERE REQUIRED FOR INSTRUMENTATION OR AT PRESSURE RELIEF VALVES
	NIPPLE	SCH. 80S, ASTM A312 TYPE 304 OR 316 SMLS STAINLESS STEEL

3) FOR REFRIGERANT PIPING, USE THE LATEST REVISION OF THE FOLLOWING CWELD PIPING WELDING PROCEDURES:
- 1.4 STAINLESS STEEL TO STAINLESS STEEL

F) REFRIGERATION SYSTEM CO2 HAND, CONTROL AND SAFETY VALVES:

1) ALL CO2 REFRIGERATION BALL VALVES SHALL HAVE A VENTED BALL DESIGN. ONLY VALVES FROM THE FOLLOWING MANUFACTURERS ARE TO BE USED, KEYSTONE
2) GLOBE VALVES TO BE INSTALLED WITH STEM IN HORIZONTAL PLANE WHEREVER POSSIBLE
3) HAND SHUTOFF VALVES USED ON OUTDOOR APPLICATIONS OR ON LOW TEMPERATURE (VACUUM) APPLICATIONS SHALL BE FITTED WITH SEAL CAPS. ALL OTHER GLOBE OR ANGLE VALVES SHALL HAVE HANDWHEELS
4) CO2 HAND VALVE, PRESSURE REGULATOR, AND MULTI-VALVE CONNECTIONS:
- 1/2" TO 2" BUTT WELD OR SOCKET WELD WHERE POSSIBLE
- 1/4" TO 1/2" INSTRUMENTATION & SPECIALTY COUP. - THREADED
5) CARBON DIOXIDE PRESSURE RELIEF VALVES TO BE MANUFACTURED BY FACCON AND TO HAVE A VALID CURRENT CRN REGISTRATION NUMBER

CO2 RELIEF VALVE SCHEDULE			
TAG	LOCATION	SETTING	SIZE, MFG SERIES, & MODEL
		[illegible] psig	
		1740 psig	
		N/A	
		1160 psig	
		1160 psig	
		N/A	
		2150 psig	
		2150 psig	

G) GLYCOL SYSTEM:

GLYCOL SYSTEM	SYSTEM PRESSURES: DESIGN	OPERATING	TEST (MIN.)
ICE RINK COOLING GLYCOL TEMP. = 13°F [-10°C]	120 psig [861 kPa]	70 psig [397 kPa]	95 psig [474 kPa]

H) REFRIGERATION SYSTEM GLYCOL PIPING:

1) ALL WATER PIPE AND FITTINGS SHALL BEAR THE MANUFACTURER'S IDENTIFICATION AND CONFORM TO THE FOLLOWING STANDARDS

GLYCOL SYSTEM CARBON STEEL PIPING		
SIZE & TYPE	TYPE	MATERIAL
2" IPS TO 4" IPS	PIPE	SCH. 40, ASTM A53-B ERW CARBON STEEL
	FITTING	SCH 40, ASTM A234-B CARBON STEEL, BUTT WELD OR 3,000 LB, ASTM A105-B FORGE STEEL, SOCKET WELD
1-1/2" IPS & SMALLER	PIPE	SCH 40, ASTM A53-B ERW CARBON STEEL
	FITTING	3000 LB, ASTM A105-B FORGED STEEL, THREADED OR SOCKET WELD

I) REFRIGERATION SYSTEM GLYCOL HAND AND CONTROL VALVES:

1) ALL GLYCOL HAND SHUTOFF VALVES SHALL BE BALL VALVES OR BUTTERFLY VALVES
2) UNIQUE TYPE USED:
- 3/4" TO 1" THREADED REDUCED PORT 1 PIECE BALL VALVES
- 1-1/4" TO 2" THREADED FULL PORT 2 PIECE BALL VALVES
- 2-1/2" TO 8" FULL LUG TYPE BUTTERFLY VALVE.
3) BALL VALVES TO BE CARBON STEEL CONSTRUCTION WITH STAINLESS STEEL BALL AND LEVER ACTUATOR WITH STEM EXTENSION. BALL VALVES TO HAVE A RATED WORKING PRESSURE OF 600 PSIG
4) BUTTERFLY VALVES TO BE FULL LUG STYLE AND CONSTRUCTED WITH DUCTILE IRON BODY, DUCTILE IRON NICKEL PLATED DISC, STAINLESS STEEL SHAFT, BUNA-N SEAT AND TEFZEL (110) POSITION LEVER LOCK HANDLE. BUTTERFLY VALVE TO HAVE RATED WORKING PRESSURE OF 225 PSIG

J) GLYCOL FIELD PIPING:

1) PIPE AND VESSEL INSULATION SHALL MEET PROVINCIAL AND NATIONAL BUILDING CODE STANDARDS
2) ALL PIPES AND PRESSURE VESSELS WHICH WILL HAVE TEMPERATURE LOSS OR GREAT DEGREE NORMAL OPERATION MUST BE INSULATED WITH THICKNESS AS SHOWN IN [ ] AND FINISHED WITH JACKET COVERING
3) REFRIGERATION SYSTEM INSULATION MATERIALS TO COMPLY TO FOLLOWING SPECIFICATIONS:

REFRIGERATION SYSTEM INSULATION		
EQUIPMENT/ LOCATION	TYPE	MATERIAL
BURIED GLYCOL PIPING	INSULATION	50MM (2") EXTRUDED POLYSTYRENE RIGID INSULATION (DENSITY=48 kg/m3) WITH TONGUE AND GROOVE JOINTS
	VAPOUR BARRIER	ITW SAPAN 540 OR EQUAL SELF ADHESIVE MEMBRANE
	JACKETING BY:	HENRY BLUESKIN WATER PROOF MEMBRANE OR EQUAL
ABOVE GRADE GLYCOL PIPING	INSULATION	ITW TYVEK 2080 POLYISOCYANURATE RIGID INSULATION (DENSITY=40 kg/m3) WITH TONGUE AND GROOVE JOINTS
	VAPOUR BARRIER	ITW SAPAN 540 OR EQUAL SELF ADHESIVE MEMBRANE
	JACKETING BY:	25MM (1") WHITE PREFORMED GLOSS FINISH PVC STANDARD

4) PIPING AND VESSEL INSULATION TO BE INSTALLED WITH [illegible] JOINTS. FOR THICKNESS OF 3" AND OVER, PIPE INSULATION TO BE APPLIED PER MANUFACTURER'S RECOMMENDATIONS ACCEPTABLE TRADE PRACTICES. ALL JOINTS TO BE OFFSET & STAGGERED
5) USE SEALERS OR FASTENERS ARE PERMITTED FOR JACKET INSTALLATION THAT COULD PUNCTURE THE VAPOUR BARRIER
6) OPEN ENDS OF INSULATION SHALL BE SEALED WITH VAPOUR BARRIER AND COVERED WITH APPROPRIATE JACKETING
7) INSULATED PIPING MUST BE PROTECTED WITH GALVANIZED SHEET METAL INSULATION SHIELDS AT ALL SUPPORT LOCATIONS. PIPE SHIELDS SHALL BE PRE-FORMED TO MATCH PIPE CURVATURE AND SECURED WITH STAINLESS STEEL BANDING.
8) PIPING AND EQUIPMENTS INSULATION THICKNESS WILL CONFORM TO CIMCO REFRIGERATION THERMAL INSULATION STANDARD REV.0, AND THICKNESS AS SHOWN ON P&ID DRAWINGS.
9) ALUMINUM JACKETING TO COME WITH FACTORY HOT LAMINATED 3 MIL POLYSURLYN MOISTURE BARRIER ON THE INTERIOR SURFACE

K) EQUIPMENT/ PIPING HANGERS AND SUPPORTS:

1) EQUIPMENT AND PIPING HANGER SUPPORT MATERIAL SPECIFICATIONS:

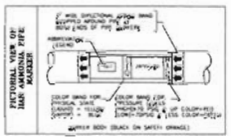
INSTALLATION AREA	HARDWARE FINISH	SUPPORT TYPE AND FINISH
HEAT REJECTION COMPRESSOR ROOM	ZINC PLATED	HANGER, RINGLOCK, HOT DIPPED GALV'D STEEL EVAPORATOR SECONDARY STEEL, HOT DIPPED GALV'D GLYCOL CLAMPS, ZINC PLATED
BUILDING EXTERIOR AND ROOFTOP	ZINC PLATED	PIPE SUPPORTS, HOT DIPPED GALV'D STEEL GLYCOL CLAMPS, HOT DIPPED GALV'D
PROCESS AREA & MECHANICAL ROOMS	ZINC PLATED	PIPE SUPPORTS, ZINC PLATED EVAPORATOR SECONDARY STEEL, HOT DIPPED GALV'D GLYCOL CLAMPS, ZINC PLATED

2) ALL PIPING TO BE SUPPORTED USING ACCEPTABLE TRADE PRACTICES, WITH MAXIMUM SUPPORT SPACING AND ROD SIZES AS FOLLOWS:

PIPING HANGER SPACING AND HANGER ROD SPECIFICATION		
PIPE SIZE (NPS)	MAX. HORIZONTAL SPAN (FT)	MIN. ROD DIAMETER (INS)
1/2"-3/4"	6	3/8"
1"	8	3/8"
1-1/4"	8	3/8"
1-1/2"	9	3/8"
2"	10	3/8"
2-1/2"	11	3/8"
3"	12	3/8"
4"	14	5/8"
5"	16	5/8"
6"	17	7/8"
8"	19	7/8"
10"	22	7/8"
12"	23	7/8"

L) PAINTING AND PIPE IDENTIFICATION:

1) ALL REFRIGERATION SYSTEM PIPING TO BE PAINTED AS FOLLOWS:
- PVC AND GALVANIZED PIPING - NO PAINT OR FINISH
- NON-INSULATED STEEL PIPE:
  - PRIMER - ONE (1) COAT KEM KROMIK UNIVERSAL METAL PRIMER
  - PAINT - ONE (1) COAT SHERWIN WILLIAMS INDUSTRIAL ENAMEL
    - RELIEF PIPING, SAFETY: RED
    - UN-INSULATED AMMONIA PIPING, SAFETY: YELLOW
    - BRINE & GLYCOL PIPING, DARK GREEN
- INSULATED STEEL PIPE: ONE (1) COAT KEM KROMIK UNIVERSAL METAL PRIMER
2) USE PIPE IDENTIFICATION MARKERS APPROVED BY SMF ON ALL AMMONIA PIPING. USE PIPE IDENTIFICATION MARKERS ON ALL WATER PIPING. PIPE MARKERS TO BE SUITABLE FOR APPLYING TO EXTERIOR PIPING
3) PIPE IDENTIFICATION TO BE APPLIED TO PIPE AT 20 M INTERVALS AND/ OR ON EACH SIDE OF WALL OR ROOF PENETRATIONS
4) DIRECTIONAL ARROWS TO BE APPLIED AT EACH PIPE IDENTIFICATION MARKER. DIRECTIONAL ARROW SHALL POINT TO DIRECTION OF FLOW
5)



M) PIPE IDENTIFICATION LEGEND:

TAG	PIPING IDENTIFICATION
CO2 GAS	CO2 GAS LOOP 4 REVISION
CO2 HSD	CO2 HIGH SIDE DISCHARGE
CO2 RV	CO2 RELIEF VENT
CG S	COOLING GLYCOL SUPPLY
CG R	COOLING GLYCOL RETURN
G EX	GLYCOL EXPANSION
G OF	GLYCOL OVERFLOW
DCW S	DOMESTIC COLD WATER RETURN
DCW R	DOMESTIC COLD WATER SUPPLY
HG R	HANDA GLYCOL RETURN
HG S	HANDA GLYCOL SUPPLY

N) REGISTRATION NUMBER (TSSA)

REGISTRATION NUMBER: N/A

O) CO2 SYSTEM EVACUATION:

REFER TO CARNOT VACUUM PROCEDURE

P) CO2 SYSTEM CHARGING:

CONSULT WITH CARNOT START-UP MECHANIC

Q) SYSTEM NAMEPLATE:

REV.	REVISION DATE	DESCRIPTION
0	2018-07-31	ISSUE FOR REVIEW
1	2018-08-31	ISSUE FOR REVIEW
2	2018-09-13	ISSUE FOR REVIEW
3	2018-09-20	ISSUE FOR REVIEW

SAP REFERENCE No.: -

5640 SHERWAY DRIVE, MARIE DOWNTOWN CIVIC PLAZA
MISSISSAUGA, ONTARIO

SAFETY AND REFRIGERATION SYSTEM GENERAL NOTES, SPECIFICATIONS & PIPING IDENTIFICATION

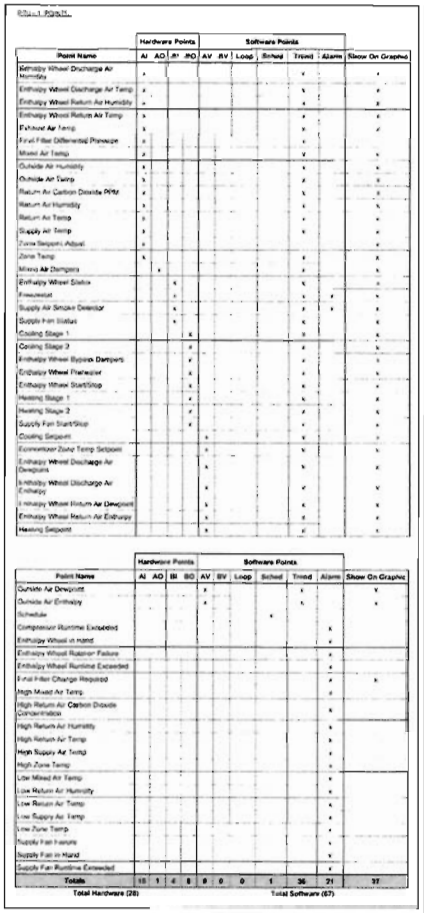
CIMCO

TORONTO

3173169

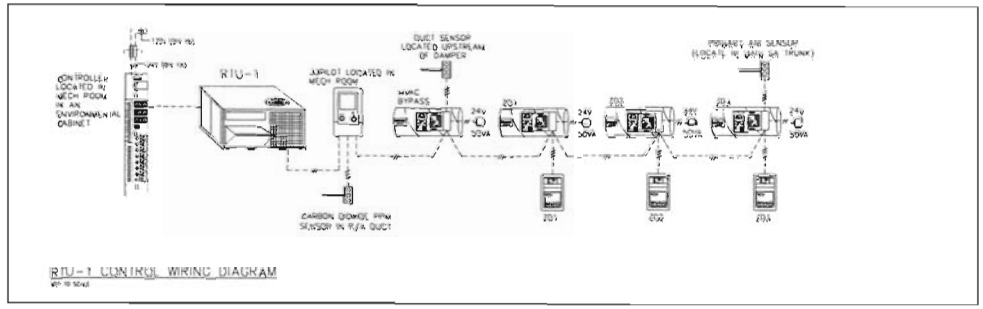
M-HUB-20

R1000

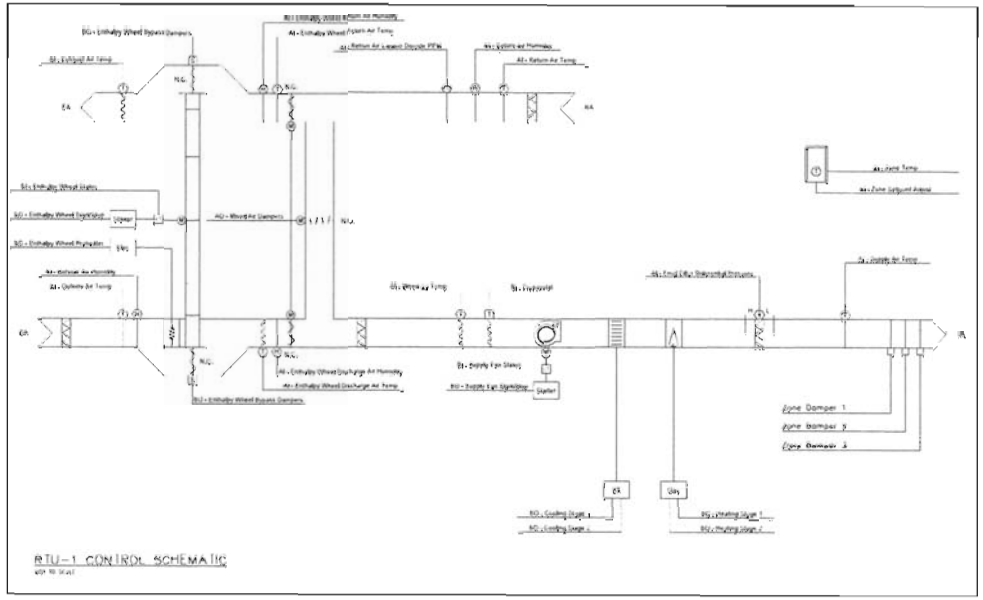


Point Name	Hardware Points			Software Points							
	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Enthalpy Wheel Discharge Air Humidity	x								x		x
Enthalpy Wheel Discharge Air Temp	x								x		x
Enthalpy Wheel Return Air Humidity	x								x		x
Enthalpy Wheel Return Air Temp	x								x		x
Exhaust Air Temp	x								x		x
Final Filter Differential Pressure	x								x		
Mixed Air Temp	x								x		x
Outside Air Humidity	x								x		x
Outside Air Temp	x								x		x
Return Air Carbon Dioxide PPM	x								x		x
Return Air Humidity	x								x		x
Return Air Temp	x								x		x
Supply Air Temp	x								x		x
Zone Setpoint Adjust	x										x
Zone Temp	x								x		x
Mixing Air Dampers		x							x		x
Enthalpy Wheel Status			x						x		x
Freezestat			x							x	x
Supply Air Smoke Detector			x						x	x	x
Supply Fan Status			x						x		x
Cooling Stage 1				x					x		x
Cooling Stage 2				x					x		x
Enthalpy Wheel Bypass Dampers				x					x		x
Enthalpy Wheel Preheater				x					x		x
Enthalpy Wheel Start/Stop				x					x		x
Heating Stage 1				x					x		x
Heating Stage 2				x					x		x
Supply Fan Start/Stop				x					x		x
Cooling Setpoint									x		x
Economizer Zone Temp Setpoint									x		x
Enthalpy Wheel Discharge Air Dewpoint									x		x
Enthalpy Wheel Discharge Air Enthalpy									x		x
Enthalpy Wheel Return Air Dewpoint									x		x
Enthalpy Wheel Return Air Enthalpy									x		x
Heating Setpoint									x		x

Point Name	Hardware Points				Software Points						
	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	Show On Graphic
Outside Air Dewpoint					x				x		x
Outside Air Enthalpy					x				x		x
Schedule								x			
Compressor Runtime Exceeded										x	
Enthalpy Wheel in Hand										x	
Enthalpy Wheel Rotation Failure										x	
Enthalpy Wheel Runtime Exceeded										x	
Final Filter Change Required										x	x
High Mixed Air Temp										x	
High Return Air Carbon Dioxide Concentration										x	
High Return Air Humidity										x	
High Return Air Temp										x	
High Supply Air Temp										x	
High Zone Temp										x	
Low Mixed Air Temp										x	
Low Return Air Humidity										x	
Low Return Air Temp										x	
Low Supply Air Temp										x	
Low Zone Temp										x	
Supply Fan Failure										x	
Supply Fan in Hand										x	
Supply Fan Runtime Exceeded										x	
Totals	**10**	**1**	**4**	**8**	**8**	**0**	**0**	**1**	**36**	**21**	**27**
Total Hardware (28)					**Total Software (67)**						



RTU-1 CONTROL WIRING DIAGRAM



RTU-1 CONTROL SCHEMATIC

FOR INFORMATION ONLY

mgp
architects + engineer inc.
425 East Street
Sault Ste. Marie, ON
P6A 3C7

PRELIMINARY ONLY NOT FOR CONSTRUCTION
DATE
FEB 23, 2022

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

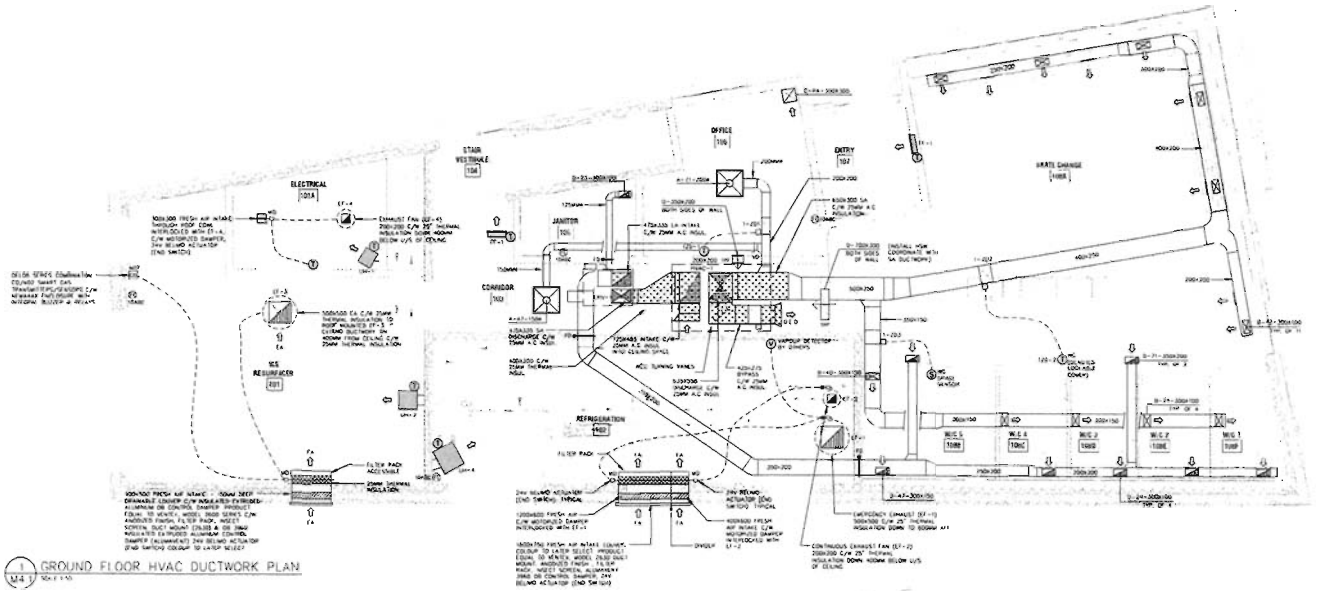
Revisions

CONTROLS DRAWING

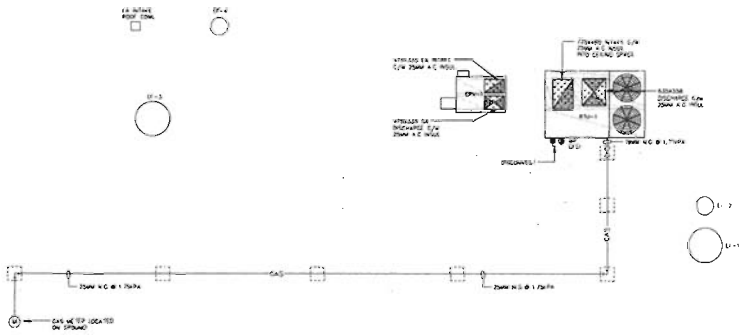
Scale: AS SHOWN
P.E.C.: J.P.
Design: K.P.
Drawn: RC
Date: FEB 23, 2022
Project

Number
2053 A2053007

M7.1



1 / M4.1 GROUND FLOOR HVAC DUCTWORK PLAN



2 / M4.1 ROOF PLAN NATURAL GAS PIPING PLAN

mgp
architects + engineers inc.
123 East Street
Sault Ste. Marie, ON
P6A 3C7
tel. 705.942.9494 mgp-arch-eng.ca

VERSION
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
DATE
FEB 23, 2022

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

N

3	ISSUED FOR TENDER	FEB 23, 2022
2	COORDINATION REVIEW	FEB 22, 2022
1	ISSUED FOR PRICING	OCT 14, 2021
#	Revision	Date

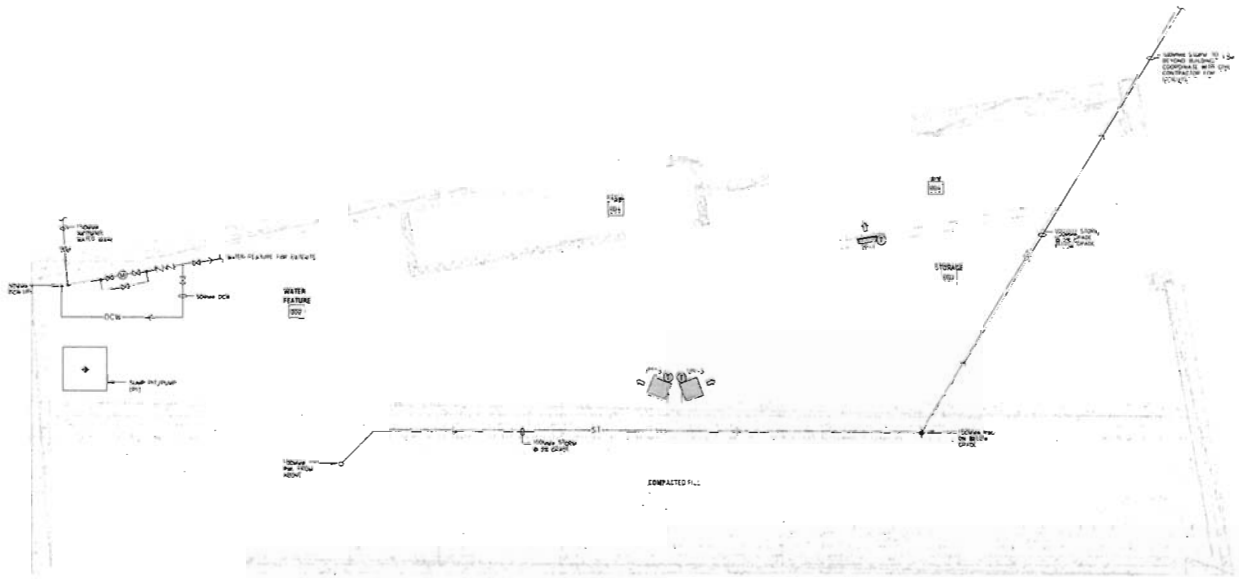
Revisions

GROUND FLOOR HVAC
DUCTWORK AND ROOF
NATURAL GAS PIPING PLAN

Scale	:	AS NOTED
P.I.C.	:	EJP
Design	:	EJP
Drawn	:	BK
Date	:	FEB 23, 2022
Plotted	:	

Number
20003 20003M004

M4.1



M1.2 BASEMENT DCW & STORM PIPING/HEATING PLAN

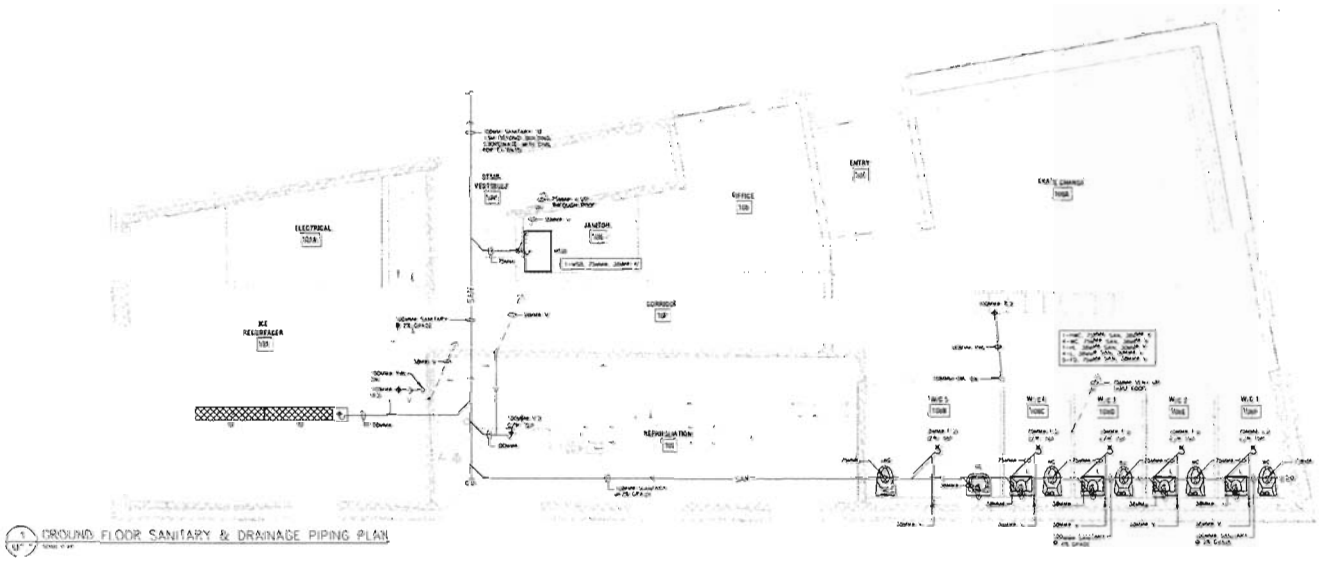
mgp
architects + engineer inc.

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

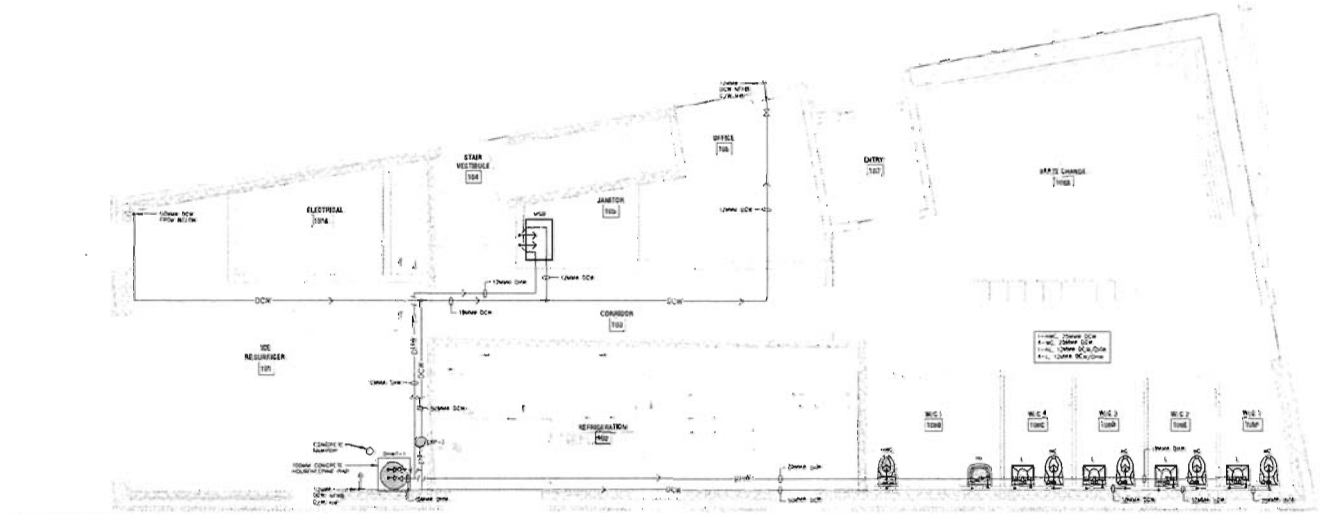
N

BASEMENT DCW/STORM/HEATING PLAN

M1.2



1 GROUND FLOOR SANITARY & DRAINAGE PIPING PLAN



2 GROUND FLOOR DCW/DHW PIPING PLAN

mgp
architects + engineers inc
123 Huron Street
Sault Ste. Marie, ON
P6A 3C7
tel 705.942.xxxx

PRELIMINARY ONLY
NOT FOR CONSTRUCTION
FEB 03, 2022

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

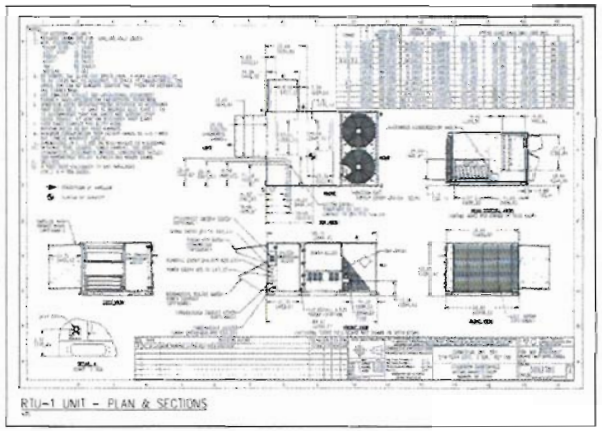
Revisions

SANITARY AND DRAINAGE/DCW/DHW PIPING PLAN

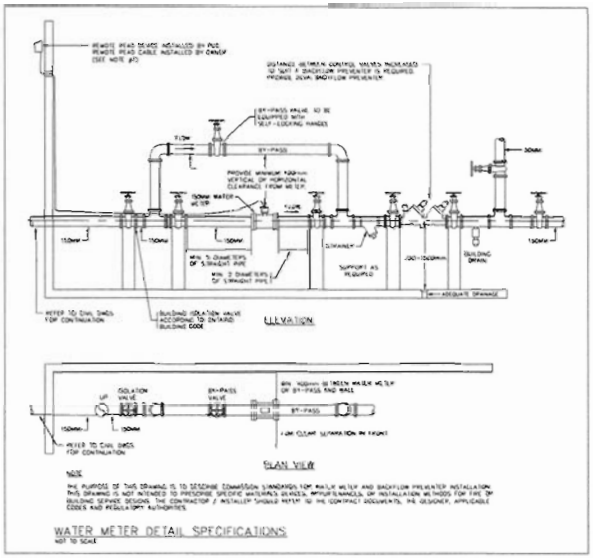
Scale: AS NOTED
P.I.C.:
Designer:
Project No.:
Date: FEB 03, 2022
Plotted:

Number
ISSUE REVISION

M1.1



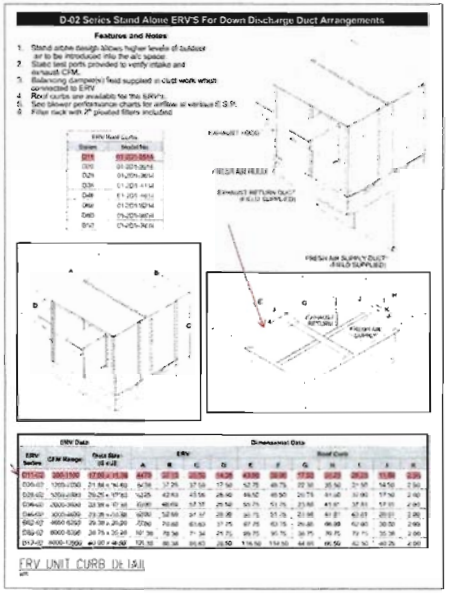
RTU-1 UNIT - PLAN & SECTIONS



WATER METER DETAIL SPECIFICATIONS

WATER METER DETAIL NOTES:

1. ALL PLUMBING INSTALLED WILL BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE
2. ALL WATER METER INSTALLATIONS SHALL CONFORM WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. METER TO BE SUPPLIED BY OWNER, SUBJECT TO PUC APPROVAL
4. THIS DRAWING IS APPLICABLE FOR 40, 25, 50, 100 and 150mm METER INSTALLATIONS
5. METERS 50mm & LARGER SHALL BE HORIZONTAL
6. THE WATER METER MUST BE INSTALLED IN A MECHANICAL ROOM ACCESSIBLE TO PUC EMPLOYEES FOR READINGS AND REPAIRS. THE WATER METER SHALL NOT BE INSTALLED IN A CRAWL SPACE. WATER METERS SHALL BE INSTALLED WITH A MINIMUM 900mm UNOBSTRUCTED CLEARANCE ABOVE THE WATER METERS INSTALLED HORIZONTALLY IN LINE WITH AN APPROVED BACKFLOW PREVENTER CAN BE INSTALLED AT THE SAME ELEVATION AS THE BACKFLOW PREVENTER REQUIREMENT AS LONG AS THE WATER METER IS PROPERLY SUPPORTED
7. PUC REQUIRES BACKFLOW PREVENTERS ON ALL MODERATE AND SEVERE HAZARD SERVICES. BACKFLOW PREVENTER INSTALLED SHALL BE SELECTED AND INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AND THE ONTARIO BUILDING CODE. BOTH DOMESTIC AND FIRE SUPPLY WILL HAVE SEPARATE BACKFLOW PREVENTERS. PROTECTION AGAINST THERMAL EXPANSION IS MISSING/NOT ACCEPTABLE TO THE ONTARIO BUILDING CODE
8. REMOTE READ DEVICE REQUIRES 22 GAUGE, 3 CONDUCTOR WIRE WITH UV PROTECTED JACKET. CONTACT LOCAL UTILITY COMPANY FOR AVAILABILITY. THE BUILDING OWNER IS RESPONSIBLE FOR INSTALLATION OF THE WIRE FROM THE METER TO THE OUTSIDE OF THE BUILDING. LOCAL UTILITY COMPANY REQUIRES A MINIMUM OF 1.0M OF WIRE TO BE COILED AT WATER METER SETTING AND AT THE LOCATION OF THE REMOTE READ SENSOR
9. WATER HEATERS SHALL BE PROTECTED FROM FREEZING. NON-INSULATION: PLACE ON, OR AROUND ANY WATER METER SHALL BE EASILY REMOVABLE AND REPLACEABLE AND SHALL NOT CONTAIN ASBESTOS OR ANY OTHER FORM OF HAZARDOUS MATERIALS. SUCH INSULATION SHALL NOT COVER OR OBSTRUCT THE TAMPER METER REGISTER. PUC SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE TO SUCH INSULATION DURING ANY REMOVAL OR REPLACEMENT OF WATER METER
10. THE PRIVATE WATER SERVICE PIPE SHALL BE FLUSHED PRIOR TO AND AFTER THE INSTALLATION OF THE WATER METER. THE WATER METER WILL BE SEALED BY THE LOCAL UTILITY COMPANY

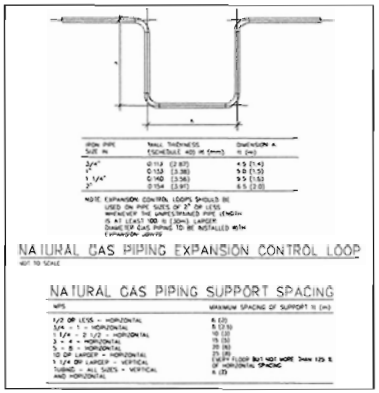


D-02 Series Stand Alone ERV'S For Down Discharge Duct Arrangements

Features and Notes:

1. Stand alone design allows higher levels of outdoor air to be introduced into the a/c system
2. Static test ports provided to verify intake and exhaust CFM.
3. Balancing dampers(s) field supplied in duct work when connected to ERV
4. Roof curbs are available for this ERV's.
5. See blower performance charts for airflow at various E.S.P.
6. Filter rack with 2" pleated filters included

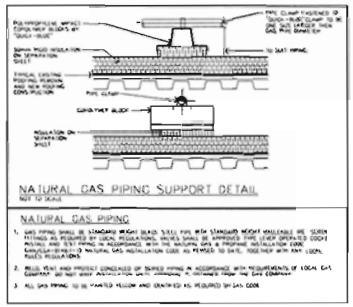
ERV UNIT CURB DETAIL



NATURAL GAS PIPING EXPANSION CONTROL LOOP

NATURAL GAS PIPING SUPPORT SPACING

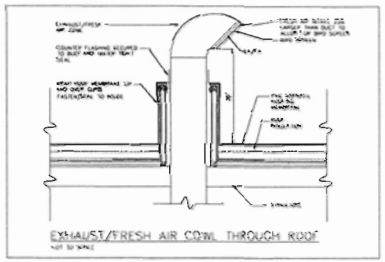
NPS	MAXIMUM SPACING OF SUPPORTS m (m)
1/2" OR LESS - HORIZONTAL	1.8 (2)
3/4" - 1" - HORIZONTAL	2.1 (2.5)
1 1/4" - 2 1/2" - HORIZONTAL	3.0 (3)
3" - 4" - HORIZONTAL	4.5 (5)
5" - 8" - HORIZONTAL	6.0 (6)
10" OR LARGER - HORIZONTAL	7.5 (8)
1 1/4" OR LARGER - VERTICAL	EVERY FLOOR BUT NOT MORE THAN 12m (4)
TUBING - ALL SIZES - VERTICAL AND HORIZONTAL	1.2 (4) OF HORIZONTAL SPACING



NATURAL GAS PIPING SUPPORT DETAIL

NATURAL GAS PIPING

1. GAS PIPING SHALL BE STANDARD WEIGHT (SCH 40) STEEL PIPE WITH STANDARD WEIGHT MALLEABLE IRON SCREW FITTINGS AS REQUIRED BY LOCAL REGULATIONS. PIPES SHALL BE APPROVED TYPE, LEAK TESTED (100 PSI/690 kPa) AND PUT IN SERVICE IN ACCORDANCE WITH THE NATURAL GAS & PROPANE INSTALLATION CODE (CAN/CSA-B149.1) OR NATURAL GAS INSTALLATION CODE AS PERMITTED TO DATE, TOGETHER WITH ANY LOCAL RULES OR REGULATIONS.
2. INSTALL, TEST AND PROTECT CONCEALED OR BURIED PIPING IN ACCORDANCE WITH REQUIREMENTS OF LOCAL GAS COMPANY. DO NOT USE PLASTIC PIPE WITHIN 5' (1.5m) FROM THE GAS COMPANY
3. ALL GAS PIPING TO BE PAINTED YELLOW AND IDENTIFIED AS REQUIRED BY GAS CODE



EXHAUST/FRESH AIR COWL THROUGH ROOF

mgp
architects + engineer inc.

125 Lodi Street
Sault Ste. Marie, ON
P6A 2C7

tel: 705-942-9494 mgp-arch-eng.ca

ISSUED FOR PRELIMINARY ONLY NOT FOR CONSTRUCTION
FEB 03, 2022

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

3.	ISSUED FOR TENDER	FEB. 23, 2022
2.	COORDINATION REVIEW	FEB. 22, 2022
1.	ISSUED FOR PRICING	OCT. 14, 2021
#	Revision	Date

Revisions

HVAC UNITS PLAN & SECTIONS
WATER METER DETAIL

Scale	AS NOTED
P.I.C.	EJP
Design	EJP
Drawn	KK
Date	FEB 23, 2022
Plotted	

Number
2006

M0.3

DUCTWORK AND DUCTWORK ACCESSORIES

1. CONFORM TO THE REQUIREMENTS OF LOCAL BY-LAWS, MINISTRY OF LABOUR REGULATIONS, AND AUTHORITIES HAVING JURISDICTION.
2. FURNISH SHEET METAL WORK IN ACCORDANCE WITH MATERIAL SPECIFICATIONS AND CONSTRUCTION DETAILS SPECIFIED HEREIN, AND CONFORMING TO STANDARD AND RECOGNIZED PRACTICES AS DETAILED BY SMACNA DUCT CONSTRUCTION STANDARDS.
3. FURNISH ALL DUCTWORK CONSTRUCTED TO SMACNA 2" W.G. PRESSURE CLASSIFICATION, UNLESS NOTED OTHERWISE ON DRAWINGS.
4. FURNISH DUCTWORK OF GALVANIZED STEEL SHEET WITH Z-275 (G90) OR J1075 (A25) DESIGNATION ZINC COATING TO ATSM A924M (A525).
5. FURNISH DUCTS OF SIZES SHOWN ON DRAWINGS, FOR ACOUSTICALLY LINED DUCTS, ADJUST DUCT SIZE TO ACCOMMODATE LINER THICKNESS, WITH CLEAR INSIDE DIMENSIONS AS SHOWN ON DRAWINGS.
6. FABRICATE DUCTWORK FREE FROM VIBRATION, RATTLE OR DRUMMING UNDER OPERATING CONDITIONS. FURNISH INTERQUADY REINFORCEMENTS, SPACING, FRAMING, BRACING, ETC. TO COMPLY WITH PERMANENT CRITERIA.
7. FURNISH SLEEVES AT DUCT PENETRATIONS THROUGH WALLS AND FLOORS, FABRICATED FROM SAME MATERIAL AND THICKNESS SHEET MATERIAL AS FOR DUCTWORK. FURNISH CLOSURE PLATES EACH SIDE OF WALL TO COVER SLEEVE.
8. FURNISH FLANGED JOINTS AND GASKETS OF NEOPRENE OR OTHER RESILIENT NON-FLAMMABLE FOR DUCT CONNECTIONS TO AC UNITS, COILS, ETC. FABRICATE FLANGES FROM MILD STEEL ANGLES TO MATCH EQUIPMENT FLANGES.
9. EXCEPT WHERE SHOWN OTHERWISE ON DRAWINGS, FURNISH STRAP HANGERS OF 3mm x 25mm (1/8" x 1") MILD STEEL BAR STOCK FOR DUCTS UP THROUGH 760mm (30") WIDTH. BEND STRAP HANGER AROUND BOTTOM OF DUCT FOR A MINIMUM OF 50mm (2-1/2") AND ATTACH TO SIDES AND BOTTOM OF DUCT. FURNISH MILD STEEL ROD HANGERS OF 10mm (3/8") DIA. MINIMUM SIZE FOR DUCTS OVER 760mm (30") IN WIDTH AND FURNISH 30mm x 30mm x 3mm (1-1/4" x 1-1/4" x 1/8") STEEL ANGLE ACROSS BOTTOM OF DUCT AND ATTACH HANGER TO ANGLE (NOT THE DUCT).
10. LAP SLIP JOINTS IN THE DIRECTION OF FLOW MAKE EXTERNAL DIAMETER OF LOOSE END SAME AS INTERNAL DIAMETER OF MILLED END ON SLIP JOINTS. SEAL ENTIRE SURFACE OF OVERLAP WITH HIGH VELOCITY DUCT SEALER COMPOUND BEFORE SECTIONS. CONSTRUCT BUTTERFLY DISC TYPE BALANCING DAMPERS OF 10 GAUGE METAL WITH MILD PRIMED EDGES SET IN ROUND SHEET METAL HOUSING WITH RUBBER PACKING AT ENDS. SECURELY PIVOT SLIP JOINTS AND ANGLE JOINTS.
11. FURNISH FLEXIBLE TYPE ROUND DUCTWORK FOR BETWEEN FINAL SUPPLY DUCT AND AIR TERMINAL UNITS, VAV BOXES, AT CONNECTION TO CERTAIN CEILING DIFFUSERS, AND WHERE SHOWN ON DRAWINGS.
12. PROVIDE DUCTWORK AS APPROVED BY SHOWN ON DRAWINGS IN ACCORDANCE WITH STANDARDS AND RECOMMENDED PRACTICES OF ASHRAE AND SMACNA. PROVIDE REQUIRED OFFSETS AND TRANSITIONS, WHETHER SPECIFICALLY INDICATED OR NOT, TO FACILITATE DUCT ARRANGEMENT AND TO AVOID INTERFERENCE WITH BUILDING STRUCTURE, PIPING, EQUIPMENT AND SERVICES.
13. INSTALL DUCTWORK IN LOCATIONS AND AT ELEVATIONS APPROPRIATE TO CEILING HEIGHT SHOWN ON DRAWINGS. WHERE REQUIRED TO BE CONCEALED, INSTALL DUCTWORK IN SUSPENDED SPACES PROVIDED, IN WALLS AND CHASES WHERE THERE IS NO PROVISION FOR CONCEALED DUCTWORK. INSTALL AS CLOSE AS POSSIBLE TO WALLS, PARTITIONS AND SUSPENDED STRUCTURES TO ATTAIN MAXIMUM HEADROOM AND CLEARANCE.
14. INSTALL SLEEVES AND/OR DUCTS PASS THROUGH WALLS OF FLOORS AND SPACE BETWEEN DUCT AND SLEEVE WITH MINERAL WOOL AND SEAL BOTH ENDS WITH NON-SHRINKING FIRE RESISTANT SEALING COMPOUND. INSTALL SHEET METAL CLOSURE PLATES ON EACH SIDE OF WALL TO COVER SLEEVE.
15. PROVIDE SHAPE OF DUCT CHANGES. INSTALL DIVERGING FACE TO HAVE ANGLE OF SIDE OR TRANSITION PIECE NOT TO EXCEED 15 DEGREES FROM STRAIGHT RUN OF DUCT BEING CONNECTED, UNLESS SHOWN OTHERWISE ON DRAWINGS.
16. INSTALL SUPPORTS AND HANGERS AT INTERVALS NOT OVER 2400mm (8'-0") CENTRES FOR DUCTS UP TO 1500mm (5'-0") IN WIDTH AND AT 1200mm (4'-0") CENTRES FOR DUCTS 1500mm (5'-0") IN WIDTH AND OVER.
17. INSTALL MISCELLANEOUS STEEL ANGLES OR CHANNELS AS REQUIRED BETWEEN JOISTS OF BUILDING STEEL FOR STRUCTURAL SUPPORT OF DUCT WHERE BUILDING FRAMING SPACING DOES NOT COINCIDE WITH THE REQUIRED HANGER SPACING.
18. INSTALL INTERNAL ACOUSTIC INSULATION IN SPECIFIC SECTIONS OF DUCTWORK AND/OR PLENUMS AS SHOWN ON DRAWINGS.
19. FURNISH FLEXIBLE DUCT CONNECTIONS BETWEEN FANS AND/OR AIR HANDLING UNITS AND CONNECTING DUCTWORK, BETWEEN WALL COMPONENTS, IN DUCTS AT BUILDING EXPANSION JOINTS, AND IN OTHER LOCATIONS SHOWN ON DRAWINGS.
20. PROVIDE HOLLOW AIR FOIL TYPE TURNING VANES IN DUCTWORK WHERE SHOWN ON DRAWINGS AND IN ALL 90 DEGREE SQUARE DUCT ELBOWS, FABRICATED OF SAME MATERIAL AS DUCT IN WHICH THEY ARE INSTALLED.
21. INSTALL FLEXIBLE CONNECTORS WITH FLANGE AT FLOOR, NOT SHOWN, TYP.
22. INSTALL MANUAL BALANCING DAMPERS AT ALL BRANCH TAKE-OFFS.
23. FLEXIBLE DUCTWORK SHALL BE ALUMINUM HELICALLY WOUND SPIRAL DUCT.
24. INSTALL IN LABELED FIRE DAMPERS AND FIRE STOP FLAPS WHERE SHOWN AND WHERE REQUIRED. SHOP DRAWINGS SHALL BE INITIALED IN ACKNOWLEDGEMENT WITH NOTE APPROVED AS NOTED, SEE 108.
25. WHERE ROOF DUCTWORK SHALL BE LINED INTERNALLY WITH 1/2" FACED TUFTHEAT THERMOFLEX DUCT LINER. PROVIDE SUCH PIPE CLEAR OUTSIDE DIMENSIONS, WHICH INCLUDE INSULATION.
26. ALL STEEL BE COMPLETE WITH NEOPRENE CONDENSATE DRAIN EXTEND WATER 50, SEAT CONDENSATE SHALL BE WELDED, NOT ON CLIPS FLASHING.
27. SUPPLY AND INSTALL GAS VENTS FOR ALL GAS FIRED EQUIPMENT.
28. ADJUST AIR QUANTITIES TO DESIGN REQUIREMENTS. BALANCE ALL AIR SYSTEMS AND SUPPLY HEATING AIR BALANCING REPORTS IN TRIPLICATE. INCLUDE NECESSARY SPARE BELTS AND PULLEYS FOR FIELD ADJUSTMENT.
29. HEATING UNITS SHALL BE CAPPED AS SHOWN ON DRAWINGS OR EQUAL IN LENGTH, YOKE, OR SHAPE.

MECHANICAL LEGEND

SYMBOL	SYMBOL MEANING	SYMBOL	SYMBOL MEANING
	ZONE DAMPER	R/A	DENOTES RETURN AIR
	UNIT HEATER (HORIZONTAL)	E/A	DENOTES EXHAUST AIR
	UNIT HEATER (DOWN BLAST)	BDD	BACK DRAFT DAMPER
	ACOUSTICALLY INSULATED TRANSFER DUCT (SIZE AS SHOWN)	MTL	EXISTING TO BE RELOCATED ELSEWHERE
		EX	EXISTING TO REMAIN
		BB	BASEBOARD HEATER
HWS	HOT WATER HEATING SUPPLY	SF	SUPPLY FAN
HWR	HOT WATER HEATING RETURN	RF	RETURN FAN
R	REFRIGERANT LIQUID	HE	HEAT EXCHANGER
RS	REFRIGERANT SUCTION	SD	SPLITTER DAMPER
	SUPPLY AIR CEILING DIFFUSER	REM	EXISTING TO BE REMOVED
	SUPPLY AIR CEILING DIFFUSER	N.I.C.	NOT IN CONTRACT
	RETURN AIR EGG-CRATE	S/A	DENOTES SUPPLY AIR
F	EXHAUST FAN	DC	DOOR GRILLE
VD	VOLUME DAMPER		EXISTING DUCTWORK REMOVED
F.D.	FIRE DAMPER		NEW DUCTWORK
	SUPPLY AIR DUCT SECTION (UP)		EXISTING TO REMAIN
	SUPPLY AIR DUCT SECTION (DOWN)		MOTORIZED DAMPER
	RETURN AIR DUCT SECTION (UP)		ACOUSTICALLY INSULATED DUCTWORK SIZE AS NOTED
	RETURN AIR DUCT SECTION (DOWN)		THERMALLY INSULATED DUCTWORK SIZE AS NOTED
	DIFFUSER OR GRILLE OR REGISTER SIZE TYPE VOLUME CAPACITY (L/s)		ACOUSTIC TURNING VANES
			FLEXIBLE DUCT
WYE JUNCTION			FLEXIBLE CONNECTION
ACCESS DOOR (AD) ACCESS PANEL (AP)			CONCENTRIC TRANSITION IF MAX 45° DIVERGING, 60° CONVERGING
			ECCENTRIC TRANSITION IF MAX 30° (SMOOTH TO 45 WHEN USED AT ROUND TO FLAT OVAL)
	ROUND DUCT UP		SPARE SENSOR
	ROUND DUCT DOWN	T	THERMOSTAT
	BALANCING DAMPER		POWER OF GRAVITY ROOF VENTILATOR-EXHAUST (CFM)
	EXPANSION LOOP		POWER OF GRAVITY ROOF VENTILATOR-INTAKE (CFM)
1.5 WIDE - 3.5	RADIANT CEILING PANEL, 'A' DENOTES TYPE, 'WIDE' DENOTES WIDTH (FINISH IN MM, 3.5' DENOTES HEAT OUTPUT IN kW		

HVAC UNIT SPECIFICATION (YORK)

IDENTIFICATION NUMBER	MANUFACTURER AND MODEL	OUTDOOR AIR FLOW (L/S)	CAPACITY (L/S)	HEATING INPUT (kW)	HEATING OUTPUT (kW)	GROSS COOLING CAPACITY (kW)	STANDARD UNIT WEIGHT (KG)	EXTERNAL STATIC (kPa)	NOMINAL VOLTAGE	POWER SUPPLY MCA	POWER SUPPLY MOCP	BRAKE HORSEPOWER (ACTUAL)	REMARKS
RTU-1	[illegible]	2417.0	4812.0	23.45	19.83	12.81	481.3	1524	208/1/60	25.8	35	0.86	3 TON TWO STAGE COOLING SINGLE PACKAGED R-410A ULTRA HIGH EFFICIENCY AIR CONDITIONER. 17.2 SEER/11.00 EER. 80 MBH INPUT STAINLESS STEEL TWO STAGE GAS HEAT, 208/230-3-60, 4"Ø STANDARD PRODUCT EQUAL TO YORK MODEL #[illegible] C4H3N2J1K1 C 24" HIGH ROOF CURB MODEL # YCURB, 24" TALL EXHAUST EXTENSION KIT MODEL # YCEA12

ENERGY RECOVERY UNIT SPECIFICATION (YORK)

IDENTIFICATION NUMBER	MANUFACTURER AND MODEL	NET OUTSIDE AIR L/S	NET OUTSIDE AIR COOLING DB (°C)	NET OUTSIDE AIR COOLING WB (°C)	NET OUTSIDE AIR HEATING DB (°C)	OUTSIDE AIR + EXHAUST AIR TRANSFER L/S	OUTSIDE AIR + EXHAUST AIR TRANSFER COOLING DB (°C)	OUTSIDE AIR + EXHAUST AIR TRANSFER COOLING WB (°C)	OUTSIDE AIR + EXHAUST AIR TRANSFER HEATING DB (°C)	RETURN AIR CFM	RETURN AIR COOLING DB (°C)	RETURN AIR COOLING WB (°C)	RETURN AIR HEATING DB (°C)	LOAD REDUCTION SUMMER (TONS)	LOAD REDUCTION WINTER (KW)	ELECTRICAL DATA VOLTAGE	ELECTRICAL DATA MAX BREAKER SIZE	ELECTRICAL DATA AMPS	REMARKS
ERV-1	[illegible]	283.17	25.00	25.56	+9.44	237.53	24.78	17.66	13.61	-	23.89	16.67	21.11	1.20	13.5	230/3/60	15 AMPS	12 A	ENERGY RECOVERY VENTILATOR, STAND ALONE, SKID AND CANOPY, STATIONARY MOUNT, 460V/3/60 CFM, WITH 4" VARIABLE SPEED BLOWER, 208/230-3-60, PRODUCT EQUAL TO YORK MODEL # YCERV0903A4A2 C/W 24" HIGH ROOF CURB

SCHEDULE OF MISCELLANEOUS FANS

FAN No.	AREA SERVED	MODEL NO.	MANUFACTURER	PERFORMANCE DATA CAPACITY (L/S)	PERFORMANCE DATA SP (kPa)	PERFORMANCE DATA FAN RPM	PERFORMANCE DATA MOTOR (HP)	ELECTRICAL V/ø/Hz	DUCT DETAILS (mm x mm)	REMARKS
EF-1	REFRIGERATION 102	[illegible]	JENCO	642.99	79.85	1412	.75	230/1/60	560-300	1 2
EF-2	REFRIGERATION 122	[illegible]	JENCO	391.28	79.85	2552	.104	115/1/60	250-200	1 2
EF-3	STORAGE 101	[illegible]	JENCO	247.36	79.85	1371	.3	208/1/60	300-1000	1 2
EF-4	ELECTRICAL 107A	[illegible]	JENCO	38.63	20.48	-	.104	115/1/60	250-200	1 2

NOTES:
1. 24" HIGH ROOF CURB
2. BIRD SCREEN
3. BACKDRAFT DAMPER
4. VIBRATION MANUFACTURER ISOLATORS
5. SPARK RESISTANT

SCHEDULE OF GRILLES & DIFFUSERS (NAILOR)

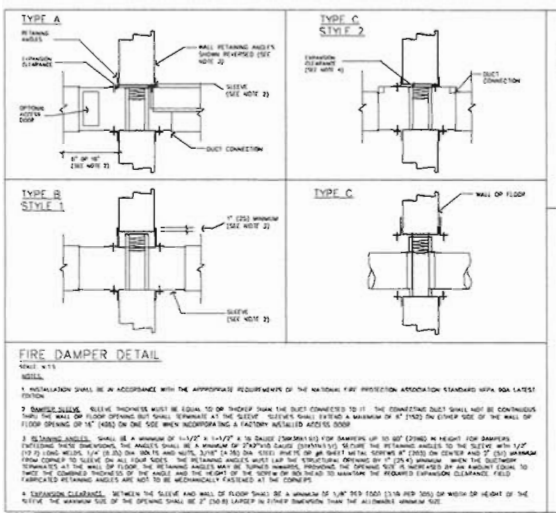
TYPE	SERVICE	MODEL NO.	MATERIAL	SIZE (mm)	FINISH	REMARKS
A	SQUARE CEILING DIFFUSERS	NAILOR - RND-24124	STEEL	FITS 10 FLOOR PLANS	WHITE	1-WAY CEILING
B	AIRFOIL DOUBLE DEFLECTION	NAILOR - 1TDH	ALUMINUM	FITS 10 FLOOR PLANS	WHITE	
C	RETURN AIR EGG CRATE	NAILOR - 51EC - TYPE 1	STEEL	FITS 10 FLOOR PLANS	WHITE	1-WAY CEILING
D	RETURN AIR GRILLE	NAILOR - 5193	STEEL	FITS 10 PLANS	WHITE	

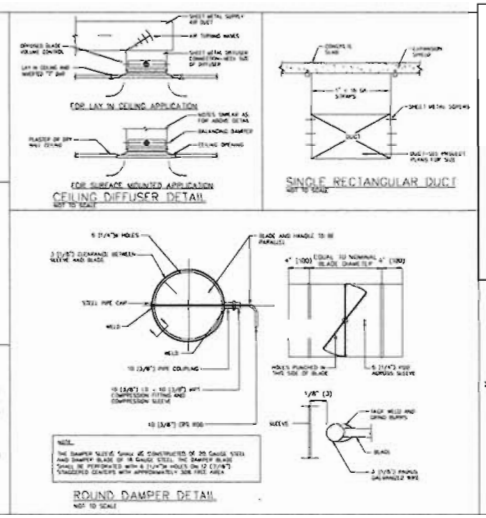
NOTES:
1. ACCEPTABLE MANUFACTURER NAILOR, OR APPROVED EQUAL

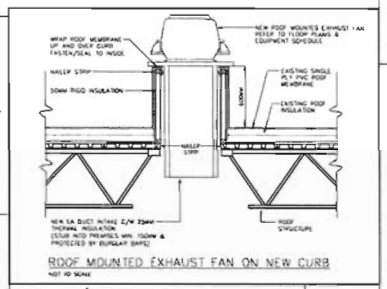
SCHEDULE OF VARIABLE VOLUME & TEMPERATURE BOXES (CARRIER)

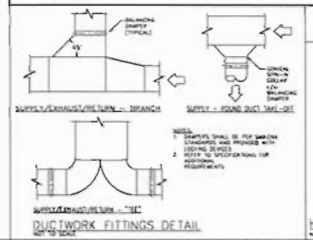
UNIT LABEL	MIN FLOW RATE (L/S)	MAX FLOW RATE (L/S)	DIMENSIONS (MM)	MODEL #	MAX A.P.D (kPa)	FPM	REMARKS
1-201	24	71	200X200	DAMPFELC	1.27	500	1 2 3
1-202	24	142	400X250	DAMPFELC	1.27	500	1 2 3
1-203	24	136	300X150	DAMPFELC	1.27	500	1 2 3
BYPASS	0	531	425X275	DAMPBAR	1.27	500	1 2

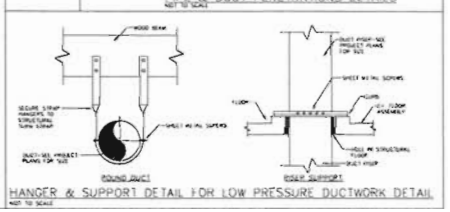
NOTES:
1. DDC CONTROL CONTRACTOR SHALL SUPPLY ALL ZONE DAMPERS/ACTUATORS INSTALLED BY MECHANICAL CONTRACTOR
2. MANUFACTURER SHALL SUPPLY ALL ZONE DAMPERS/ACTUATORS INSTALLED BY MECHANICAL CONTRACTOR
3. VAV BOXES ARE ON DEMAND CONTROL (DDC).

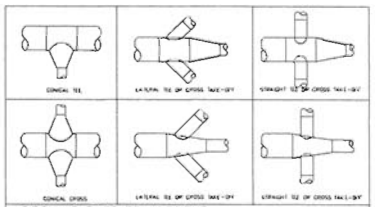


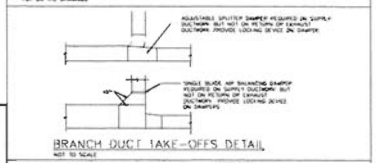


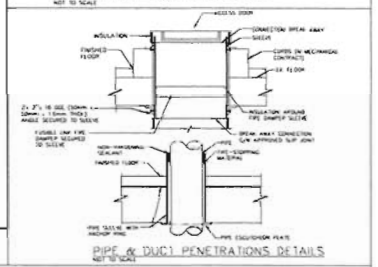












mgp
architects + engineer inc.
123 East Street
Sault Ste. Marie, ON
P6A 3C7
tel. 705.942.9494 mgp-arch-eng.ca

PRELIMINARY ONLY
NOT FOR CONSTRUCTION
DATE: FEB 23, 2022

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

4.		
3.		
2.		
1. ISSUED FOR REVIEW		FEB 23, 2022
0. CONSERVATION REVIEW		FEB 22, 2022
-1. ISSUED FOR PRICING		OCT. 14, 2021
# Revision		Date

Revisions

HVAC NOTES SCHEDULES & LEGENDS

Scale	AS NOTED
P.I.C.	EJP
Design	EJP
Drawn	MK
Date	FEB 23, 2022
Plotted	

Number
20001 20220830

M0.2

GENERAL MECHANICAL REQUIREMENTS

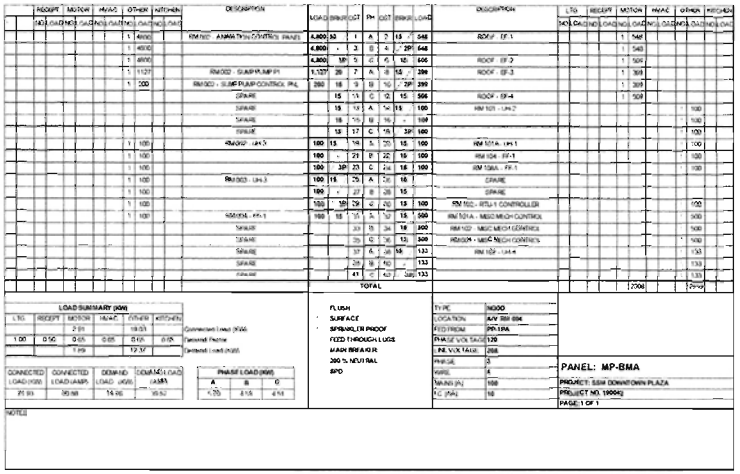
1. CONFORM TO INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS AND GENERAL REQUIREMENTS.
2. THIS SECTION APPLIES TO AND IGNORING THE WORK OF ALL SECTIONS OF DIVISION 15.
3. PROVIDE WORK IN ACCORDANCE WITH THE FULL INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS AND REQUIRED TO INSTALL AN COMPLETE OPERATING SYSTEMS.
4. THE DRAWINGS SHOW THE ARRANGEMENT AND GENERAL DESIGN. THE WORK IS SUITABLE OUTLINES ON THE DRAWINGS WITH REGARDS TO SIZES, LOCATIONS, GENERAL ARRANGEMENTS, AND METHODS IN DETAIL THE WORK AND CONDITIONS. DO NOT TO SET DOWN WORK OF ITEMS IN DIAGRAM SYSTEM WHERE A CERTAIN CASES THE DRAWINGS MAY INCLUDE DETAILS GIVING THE EXACT LOCATIONS AND ARRANGEMENTS REQUIRED.
5. BEFORE SUBMITTING TENDERS, EXAMINE SITE AND ALL DRAWINGS. CUTTING WILL NOT BE ALLOWED OF FAILURE TO DO SO.
6. PROVIDE ALL LABOUR, MATERIALS AND EQUIPMENT NECESSARY TO FACILITATE THE WORK SHOWN AND DESCRIBED INCLUDING OF WARRANTY SHALL MEET ALL APPLICABLE PROVINCIAL, FEDERAL AND MUNICIPAL REQUIREMENTS. (MBC AND OBC STANDARDS)
7. OBTAIN AND PAY FOR PERMITS REQUIRED FOR THE INSTALLATION OF MECHANICAL TRADES' WORK. ARRANGE FOR INSPECTIONS AND TESTS DESIGNATED AND PAY FOR FEES AND COSTS FOR THE PERMITS, INSPECTIONS AND TESTS. OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT.
8. MAINTAIN LIABILITY INSURANCE TO PROTECT OWNER AND THE CONTRACTOR FROM ANY AND ALL CLAIMS UNDER THE WORKERS' COMPENSATION ACT.
9. ALL MATERIALS SHALL CONFORM TO CSA, NFPC AND CGC REQUIREMENTS AND SHALL BEAR CSA LABEL. GAS FIRED EQUIPMENT SHALL BEAR CSA LABEL.
10. TEMPORARY LIGHT, POWER AND WATER BY GENERAL CONTRACTOR.
11. ALL CUTTING AND PATCHING FOR MECHANICAL WORK WILL BE THE RESPONSIBILITY OF THIS SUBCONTRACTOR AND SPECIALISTS SUBJECT TO FOR THIS WORK.
12. PROVIDE TEMPORARY GUARDRAILS AND ANCHORAL STORAGE AS REQUIRED AND BE RESPONSIBLE FOR ANY LOSS OF DAMAGE THEREFROM.
13. SUBMIT SAMPLES OF MATERIALS WHEN REQUIRED.
14. SUBMIT 3 COPIES OF SHOP DRAWINGS FOR REVIEW COVERING VALVES MANUFACTURED ITEMS, 15 DAYS, PLUMBING FIXTURES, ANTI SIPHONS, ETC.
15. SUPPLY AND LOCATE ALL ANCHORS, SUPPORTS, SLEEVES, CURBS, ETC. REQUIRED FOR THIS WORK. FURNISH BY OTHER TRADES COORDINATED BY THE CONTRACTOR.
16. UNLESS OTHERWISE NOTED, ALL MOTORS OVER 1/2 HP SHALL BE 3/ PHASE 60 CYCLE.
17. SUPPLY WIRING DIAGRAMS WITH EQUIPMENT FOR CONNECTIONS BY ELECTRICAL CONTRACTOR. CONTROLLERS FOR POWERED MECHANICAL EQUIPMENT AND MANUAL SWITCHES CONTROLLING EQUIPMENT SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR FOR INSTALLATION. THIS DOES NOT INCLUDE MOTOR STARTERS, UNLESS SPECIFICALLY NOTED.
18. ALL POWER WIRING BY ELECTRICAL CONTRACTOR. CONTROL AND INTERLOCK WIRING BY MECHANICAL CONTRACTOR.
19. SUPPLY AND INSTALL ALL WEATHERPROOF OUTLET BOXES FOR MECHANICAL EQUIPMENT WHERE WEATHERPROOF DEVICES SHALL BE USED TO CONTINUE EQUIPMENT IN THIS.
20. EXCAVATION AND BACK FILLING FOR MECHANICAL WORK WILL BE COMPLETED BUT BY THE CONTRACTOR SHALL BED THE PIPE AND BACK FILL TO 12" ABOVE PIPE FOLLOW THE 2 STAGE FOR ASSISTANCE AND AS FOUND.
21. PIPE HANGERS SHALL BE CLEVIS SPLIT TYPE, WITH MALLEABLE IRON, FOR COPPER PIPE USE PLASTIC INSERTS. DO NOT SUPPORT EQUIPMENT OR PIPING FROM UNDER ROOF DECK WITHOUT PERMISSION FROM ARCHITECTS. SUPPLY AND INSTALL NECESSARY STEEL TO TRANSFER LOAD TO CONSTRUCTING ELEMENTS.
22. ALL ESCALATOR METAL (STEEL, COPPER & BRASS) SHALL BE SEPARATED USING GASKETS OR DIELECTRIC "SWITCHING" FITTINGS.
23. INSTALL SLEEVES FOR ALL PIPES PASSING THROUGH WALLS, FLOORS AND ROOFS. PACK SPACE AROUND PIPES WITH FIBERGLASS INSULATION.
24. MAINTAIN AN ACCURATE DIMENSIONAL RECORD OF ALL UNDERGROUND PIPING AND ALL DEVIATIONS FROM PLANS TRANSMITTED ALONG SPECIFIED PIPING, EQUIPMENT AND EQUIPMENT FROM THE CONTRACT DRAWINGS. TRANSFER THIS INFORMATION TO TWO SETS OF WORKING DRAWINGS (AS-BUILT) AT THE JOB SITE AND SUBMIT TO THE OWNER'S REPRESENTATIVE UPON THE COMPLETION OF THE JOB.
25. ALL SURFACES MUST BE LEFT CLEAN AND SMOOTH, READY FOR PAINTING BY GENERAL TRADES.
26. CONTRACTOR TO PAY ALL PERMITS, USE FEES AND OTHER CHARGES REQUIRED BY LOCAL REGULATIONS AND PROVIDE ALL NECESSARY NOTICES.
27. CONTRACTOR SHALL PROVIDE CONTROL AND ADJUSTMENT OF ALL EQUIPMENT AND SYSTEMS AS REQUIRED BY A.H.R.I. STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.
28. ON COMPLETION OF THE WORK, FLUSHING, FROM THE PREMISES ALL TOOLS, DEBRIS, SURPLUS AND WASTE MATERIALS RESULTING FROM OPERATIONS UNDER THIS SECTION. CLEAN ALL EQUIPMENT AND LEAVE ALL PIPING IN PROPERLY WORKING ORDER.
29. PROVIDE THREE COPIES OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT.
30. AND INSTRUCTIONS IN LOOSE-LEAF BINDER WHEN ONLY ONE VOLUME IS REQUIRED. PROVIDE A COMPLETE INDEX WHEN THERE ONE VOLUME IS REQUIRED, INCLUDE IN THE FIRST BOOK A COMPLETE INDEX OF ALL VOLUMES AND INSTRUCTIONS. INDEX IN EACH SUCCEEDING VOLUME INCLUDES THE FOLLOWING MANUALS:
(a) MANUFACTURER'S OR PROPRIETARY, ELECTRICAL, OR, AND/OR FOR EQUIPMENT FURNISHED, THOSE DRAWINGS AND PROVIDING INSTRUMENTS INCLUDING APPROVED TO CONTRACTOR'S ELECTRICAL AND MECHANICAL EQUIPMENT, INCLUDING OPERATING INSTRUCTIONS, WITH WRITTEN EQUIPMENT INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN PROCEDURE MAINTENANCE AND PROCEDURES AND RECOMMENDED TIMES FOR CORRECTION FOR EACH ITEM OF EQUIPMENT INCLUDING VARIOUS TYPES OF LUBRICANTS COMPLETE LISTING OF EQUIPMENT, NAMEPLATE MANUFACTURER'S NAME, CATALOGUE NUMBER AND NEAREST REPLACEMENT LIST OF RECOMMENDED SPARE PARTS AND QUANTITY OF EACH ITEM TO BE STORED. MANUFACTURER'S ADDRESSES, AND GUARANTEES ALL THE ABOVE APPLIES TO EQUIPMENT AND PARTS NOT MANUFACTURED BY AND SUPPLIED OF THE EQUIPMENTS OF ANY SUPPLIED AS A COMPONENT PART OF ANY ITEM OF EQUIPMENT.
31. THE CONTRACTOR SHALL BEFORE FINAL PAYMENT IS MADE, SUBMIT ALL MATERIALS AND INFORMATION SUPPLIED BY HIM IN THE PERFORMANCE OF THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL MAKE GOOD, WITHOUT FURTHER COST TO THE OWNER UPON NOTICE, AS MAY APPEAR WITHIN THIS PERIOD.
32. ALL FLOOR DRAINS AND HEADS TO BE EQUIPPED WITH STRAINER SCREENS.

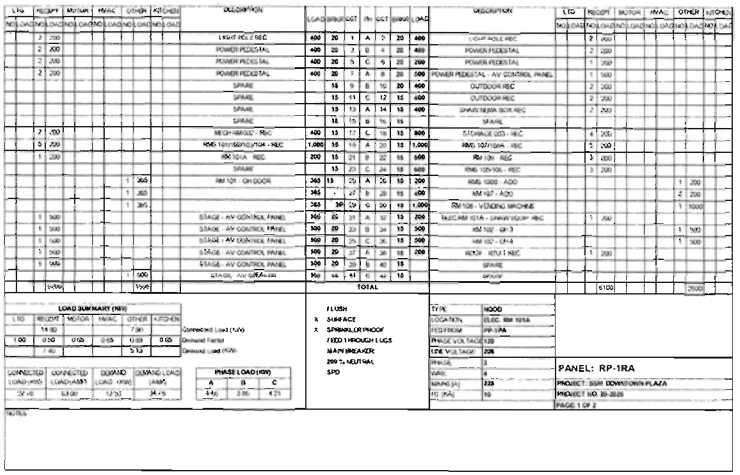
PIPING AND PIPING ACCESSORIES

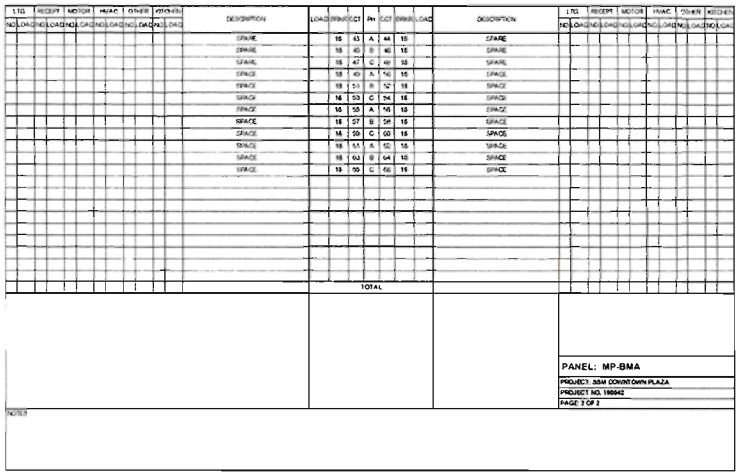
1. ALL WORK SHALL BE EXECUTED BY APPROVED PLUMBERS.
2. ALL PLUMBING AND DRAINAGE CONSTRUCTION TO THE MINIMUM STANDARDS SET BY THE PLUMBING CODE AND OTHERWISE INDICATED ON THE DRAWINGS AND SPECIFICATIONS. ALL ITEMS AND WORKMANSHIP SHALL MEET THE REQUIREMENTS OF ALL PROVINCIAL AND LOCAL BUILDING AND PLUMBING CODES AND BY-LAWS.
3. ALL BURIED SANITARY DRAINAGE PIPING SHALL BE PVC DWV SOLVENT JOINTS.
4. ALL BURIED STORM PIPING SHALL BE PVC (SDR 35).
5. CONTRACT TO LEAVE 10 FT OUTSIDE THE BUILDING.
6. ALL ABOVE GROUND DRAINAGE PIPING SHALL BE CAST IRON MECHANICAL JOINT OF DWV, CONFORMING TO CSA B70 AND CAN/CSA B602 OR COPPER DWV TYPE, HARD DRAWN TEMPER, WITH CAST BRONZE OR WROUGHT COPPER SOLDER JOINT FITTINGS AND SOLDER JOINTS. ALL PIPING SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING THE REQUIREMENTS OF THE PLUMBING CODE. ALL PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.
7. ALL ABOVE GROUND WASTE DRAINAGE PIPING SHALL BE CAST IRON MECHANICAL JOINT OF DWV, CONFORMING TO CSA B70 AND CAN/CSA B602 OR COPPER DWV TYPE, HARD DRAWN TEMPER, WITH CAST BRONZE OR WROUGHT COPPER SOLDER JOINT FITTINGS AND SOLDER JOINTS. ALL PIPING SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING THE REQUIREMENTS OF THE PLUMBING CODE. PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.
8. ABOVE GROUND WASTE PIPING INSIDE THE BUILDING SHALL BE CAST IRON MECHANICAL JOINT OF DWV, CONFORMING TO CSA B70 AND CAN/CSA B602 OR COPPER DWV TYPE, HARD DRAWN TEMPER, WITH CAST BRONZE OR WROUGHT COPPER SOLDER JOINT FITTINGS AND SOLDER JOINTS. ALL PIPING SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING THE REQUIREMENTS OF THE PLUMBING CODE. PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.
9. UNDERGROUND WATER PIPING SHALL BE TYPE K COPPER TUBING WITH SOLDER JOINTS. PIPING TO BE INSTALLED IN ACCORDANCE WITH CAN/CSA B602.
10. BURIED WATER PIPING SHALL BE COPPER TYPE K.
11. ALL VALVES OF EQUAL PORT PIPING SHALL BE FULL OPENING GATE VALVES. ALL VALVES SHALL BE SUITABLE FOR THE SERVICE FOR WHICH THEY ARE USED AND SHALL BE OF THE SAME MANUFACTURE.
12. ALL SHUT-OFF VALVES SHALL BE GATE VALVES.
13. UNIONS AND COUPLINGS SHALL BE PROVIDED IN ALL PIPING TO ALLOW FOR THE REMOVAL OF ALL EQUIPMENT AND FIXTURES.
14. ALL VALVES AND MATERIAL SHALL BE SUITABLE FOR THE SERVICE FOR WHICH THEY ARE USED AND SHALL BE OF THE SAME MANUFACTURE.
15. FLOOR DRAINS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY CODE AND WHERE SHOWN AND SHALL BE SUITABLE FOR THE SERVICE FOR WHICH THEY ARE USED.
16. ALL GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GAS CODE AND ALL NECESSARY PERMITS AND INSPECTIONS SHALL BE OBTAINED AND PAID FOR BY THE MECHANICAL CONTRACTOR. ALL GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GAS CODE AND PROPANE INSTALLATION CODE (CAN/CSA-B149.2).
17. ALL GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GAS CODE AND PROPANE INSTALLATION CODE (CAN/CSA-B149.2).
18. DOMESTIC COLD AND HOT WATER PIPING SHALL BE INSTALLED WITH TYPE "K" COPPER TUBING WITH SOLDER JOINTS. PIPING TO BE INSTALLED IN ACCORDANCE WITH CAN/CSA B602.
19. ALL VALVES SHALL BE SUITABLE FOR THE SERVICE FOR WHICH THEY ARE USED AND SHALL BE OF THE SAME MANUFACTURE.
20. ALL VALVES SHALL BE GATE VALVES.
21. ALL UNIONS AND COUPLINGS SHALL BE PROVIDED IN ALL PIPING TO ALLOW FOR THE REMOVAL OF ALL EQUIPMENT AND FIXTURES.
22. ALL FLOOR DRAINS SHALL BE EQUIPPED WITH STRAINER SCREENS.
23. ALL PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.
24. ALL PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.
25. ALL PIPING SHALL BE INSTALLED PARALLEL WITH OR AT RIGHT ANGLES TO BUILDING LINES. PROVIDE ALL NECESSARY OFFSETS, TRANSITIONS AND FITTINGS REQUIRED FOR A NEAT AND WORKMANLIKE INSTALLATION. ALL PIPING SHALL BE INSTALLED SO AS TO PROVIDE MAXIMUM HEADROOM AND MINIMUM INTERFERENCE WITH OTHER TRADES.

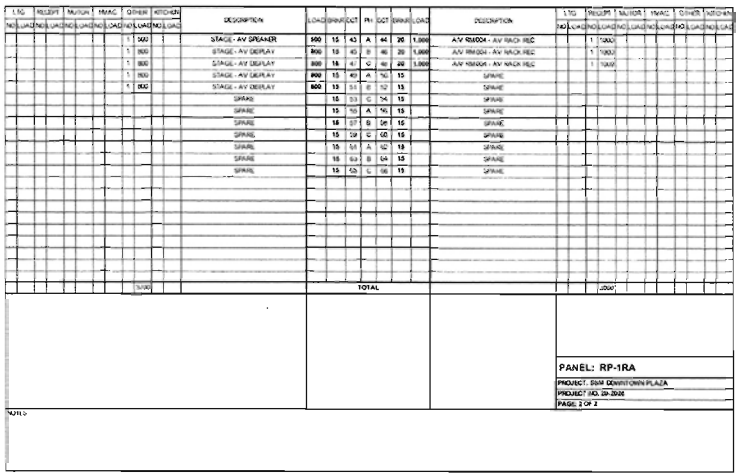
PLUMBING LEGEND

SYMBOL	SYMBOL MEANING	SYMBOL	SYMBOL MEANING









ELECTRICAL PANELBOARD SCHEDULES

MULVEY & BANANI

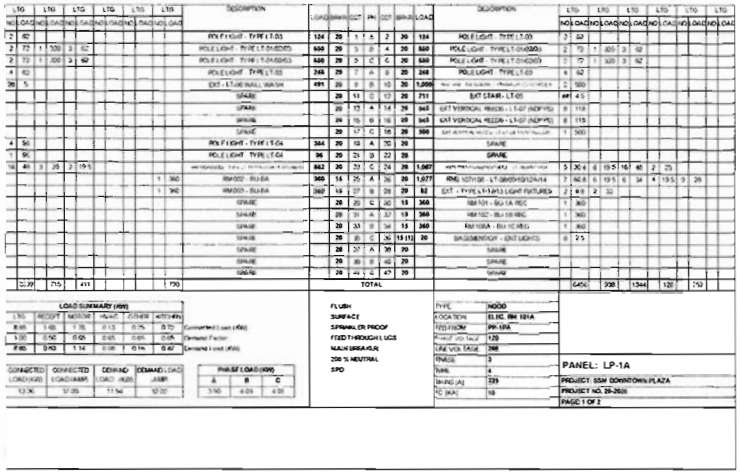
SAULT STE. MARIE DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy

PANELBOARD SCHEDULES

E-604

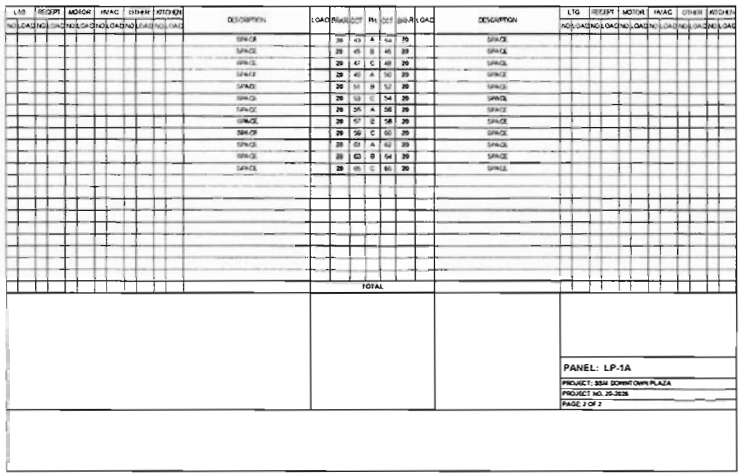


PANEL: LP-1A

PROJECT: SSM DOWNTOWN PLAZA

PROJECT NO. 20-2626

PAGE 1 OF 2

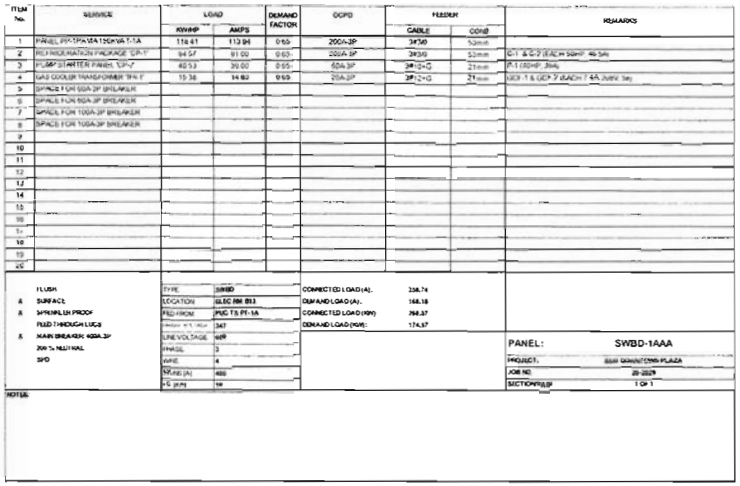


PANEL: LP-1A

PROJECT: SSM DOWNTOWN PLAZA

PROJECT NO. 20-2626

PAGE 2 OF 2

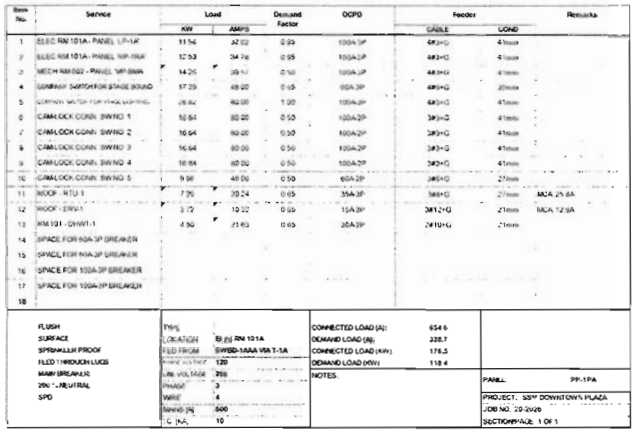


PANEL: SWBD-1AAA

PROJECT: SSM DOWNTOWN PLAZA

JOB NO. 20-2626

SECTION/PAGE: 1 OF 1



PANEL: PP-1PA

PROJECT: SSM DOWNTOWN PLAZA

JOB NO. 20-2626

SECTION/PAGE: 1 OF 1

1 ELECTRICAL PANELBOARD SCHEDULES
SCALE: NTS

MULVEY & BANANI

SAULT STE. MARIE DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy

PANELBOARD SCHEDULES

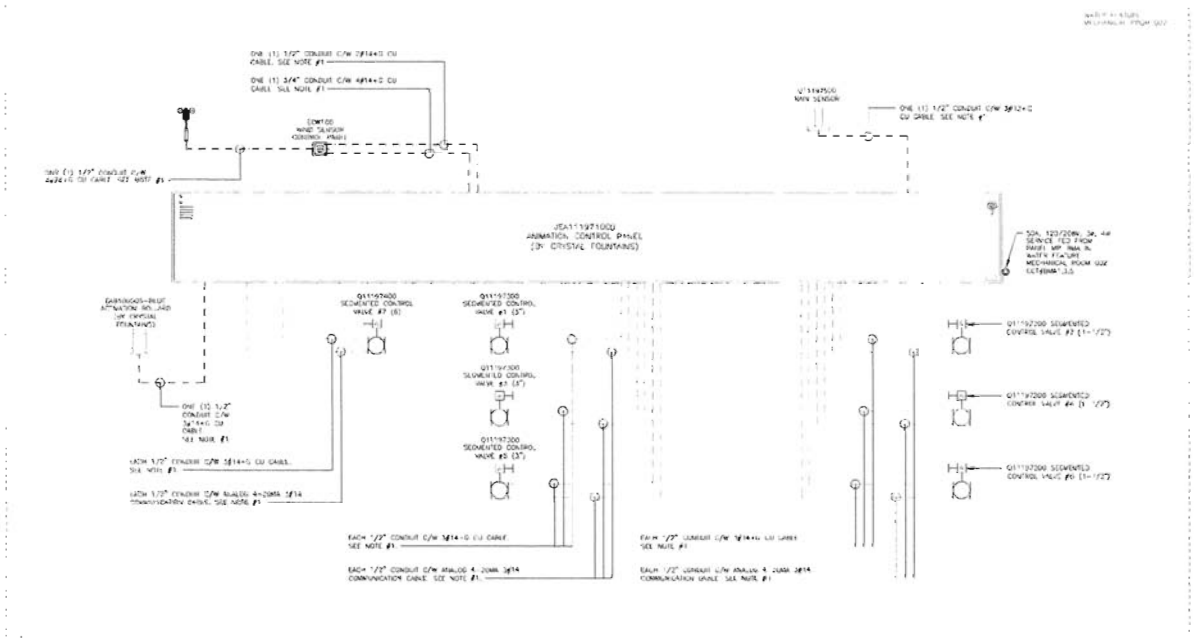
2021-JUNE

AS SHOWN

E-603

COMPONENT SUPPLIED AND INSTALLED BY WATER FEATURE CONTRACTOR		
QTY	PART NO.	DESCRIPTION
6	WAT113	DECK MOUNTED FIREFLY MULTI-STREAM JET @ 20 DEGREES
6	WAT113x30°	LIGHT SPRAY NOZZLE FOR FIREFLY JET
6	WAT126	MOUNTING BRACKETS FOR FIREFLY JET
6	WAT110	DECK MOUNTED CRYSTAL FALLS ARCHING JET @ 20 DEGREES
6	WAT126	MOUNTING BRACKETS FOR CRYSTAL FALLS JET
3	Q1319720D	CUSTOM 1-1/2" SEGMENTED CONTROL VALVE FOR CRYSTAL FALLS JETS
3	Q1197200	CUSTOM 3" SEGMENTED CONTROL VALVE FOR CRYSTAL FALLS JETS
1	Q1197400	CUSTOM 6" MAIN SEGMENTED CONTROL VALVE
1	JEA1197100D	CUSTOM FOUNTAIN CONTROLLER C/W 4 LCD (BUILT IN THE PANEL)
1	EAB10000S	STAINLESS STEEL ACTIVATION BOLLARD BLUE COLOUR
1	EDM100	WIND SENSOR
3	SS1119700	CUSTOM SS VALVE PIT (4 VALVES PER HOUSING)
1	Q1319500	RAIN SENSOR

COMPONENTS SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR (NOT SUPPLIED BY CRYSTAL FOUNTAINS)	
ITEM	POWER SUPPLY FROM MAIN SOURCE TO PANEL IN EQUIPMENT ROOM, WITH MAIN DISCONNECT
ITEM	ALL INTERCONNECTING WIRING AND CONDUIT BETWEEN CONTROLLER AND SURFACE CONTROL PANELS AND COMPONENTS



NOTES:

1. ELECTRICAL CONTRACTOR TO COORDINATE WITH WATER FEATURE CONTRACTOR FOR EXACT CONDUIT/WIRING REQUIREMENT PRIOR TO INSTALLATION

E602 ELECTRICAL PROCESS FLOW DIAGRAM
SCALE: N.T.S.

MULVEY & BANANI

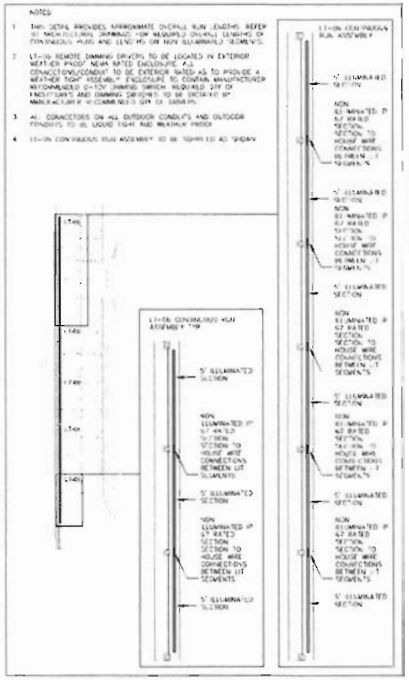
SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

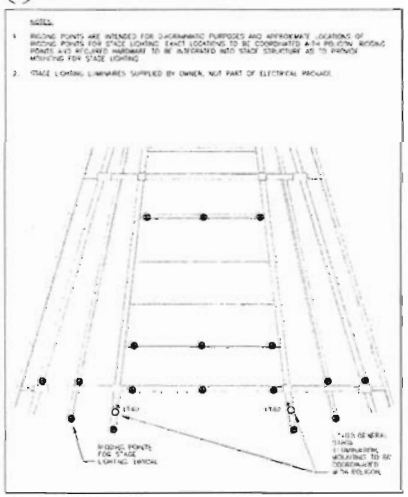
BrookMcIlroy/

ELECTRICAL DETAILS

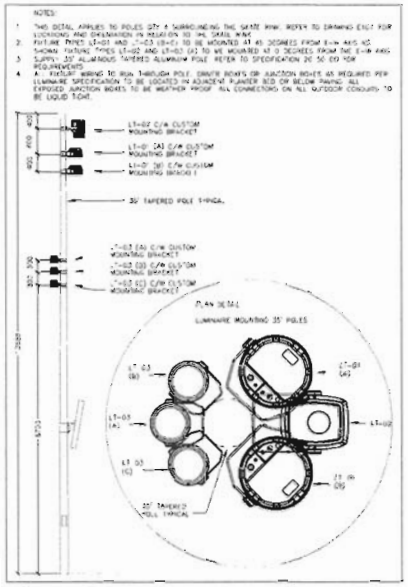
19-026 - 2020/6
DESIGNED
PC/PB/DT/SP
DRAWN
CAD
DATE
2021-JUNE
SCALE
AS SHOWN
SHEET NO.
E-602



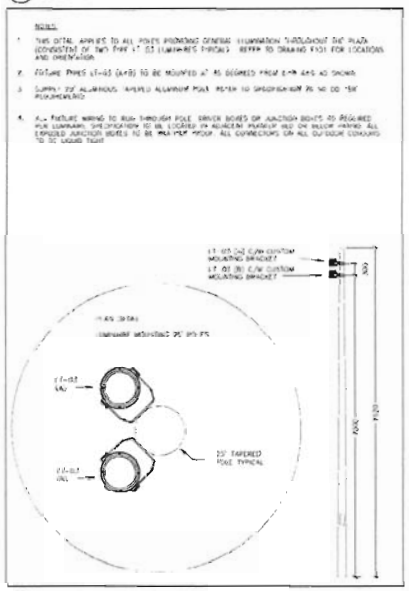
LT-06 LUMINAIRE ASSEMBLY DETAIL



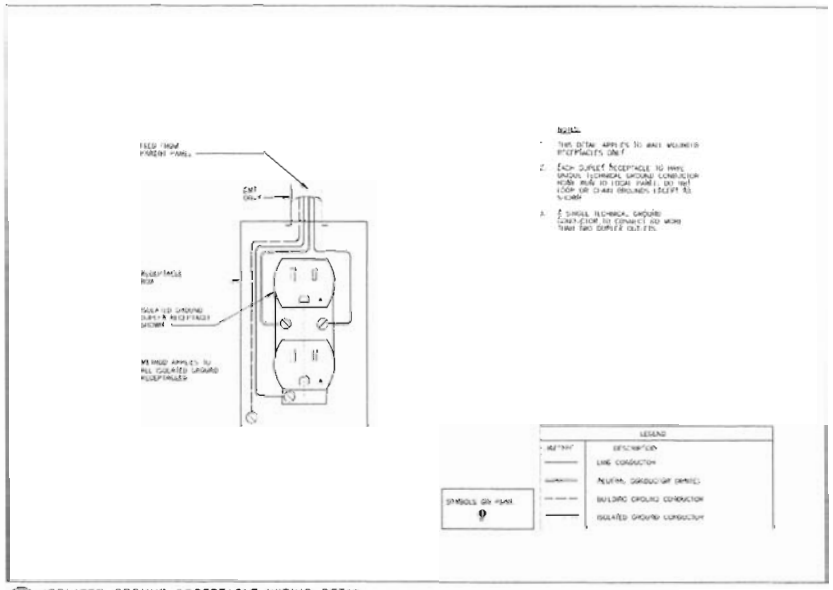
STAGE LIGHTING RIGING POINTS DETAIL



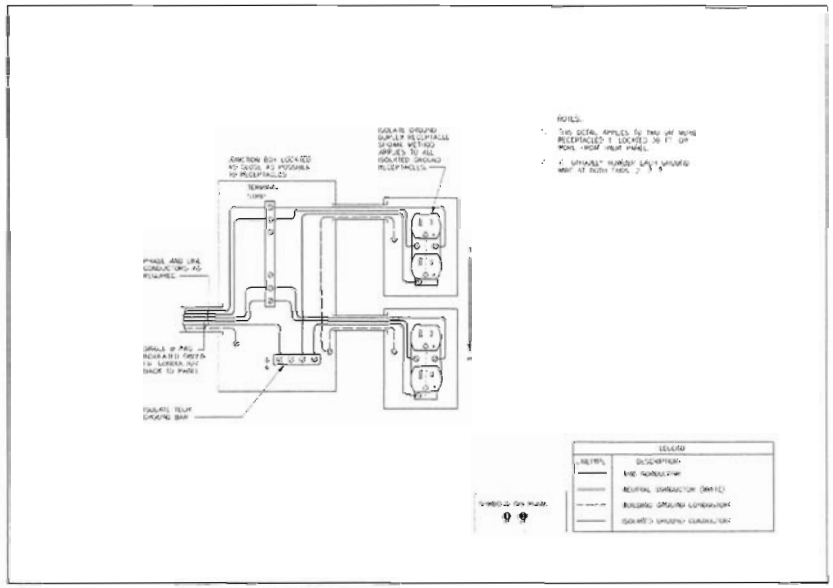
LUMINAIRE MOUNTING DETAIL – 35' POLE TYPICAL



LUMINAIRE MOUNTING DETAIL – 25' POLE TYPICAL



ISOLATED GROUND RECEPTACLE WIRING DETAIL



REMOTE ISOLATED GROUND RECEPTACEL WIRING METHOD

MULVEY & BANANI

SAULT STE. MARIE DOWNTOWN PLAZA

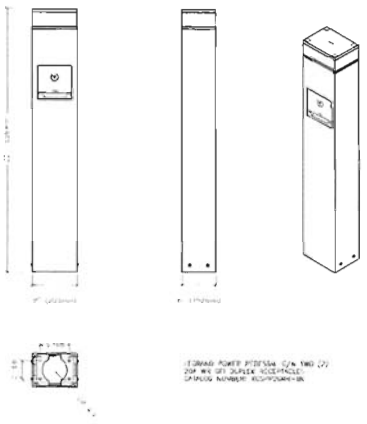
CITY OF SAULT STE. MARIE

BrookMcIlroy

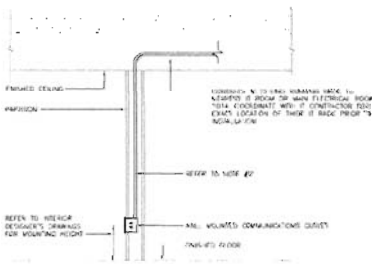
ELECTRICAL DETAILS

E-601

XXX



POWER PEDESTAL DETAIL



NOTES:

1. ALL CONDUITS SHALL BE COMPLETE WITH PULLSTRING.
2. PROVIDE CONDUITS TO FEED ALL DATA OUTLETS. ALL CABLING TO THESE OUTLETS SHALL BE IN CONDUITS. CONDUITS CAN BE JOINED TO MINIMIZE THE NUMBER OF HOME RUNS TO IT ROOM AS INDICATED IN TABLE BELOW UNLESS OTHERWISE NOTED.

CONDUIT SIZE	MAXIMUM NO. OF CAT 6A
21mm	2 CABLES
27mm	3 CABLES
35mm	6 CABLES
41mm	8 CABLES
53mm	15 CABLES
63mm	21 CABLES
78mm	34 CABLES
103mm	61 CABLES

FINISHED CEILING

PARTITION

REFER TO NOTE #2

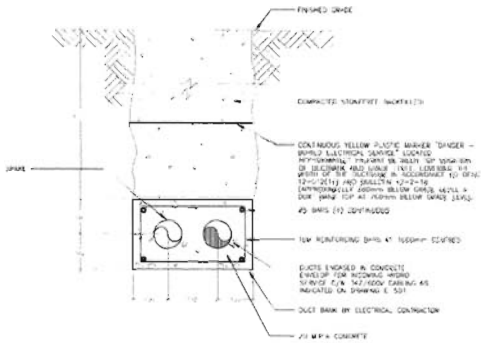
REFER TO INTERIOR DESIGNER'S DRAWINGS FOR MOUNTING HEIGHT

MIN. WOUNTED COMMUNICATIONS OUTLET

FINISHED FLOOR

SPARES ON PLAN

TYPICAL SECTION OF COMMUNICATION WALL OUTLET



NOTES:

1. ALL DUCTS SHALL BE TYPE DB2 (ESC) POLYVINYL CHLORIDE (PVC), MANUFACTURED IN ACCORDANCE WITH CSA C22.2 NO. 211.1 M1989 (OR LATEST REVISION).
2. DUCTS TO BE SUPPORTED WITH APPROVED SPACERS EVERY 3m (10 FT) AND MUST BE ANCHORED SO AS TO NOT FLOAT DURING CONCRETE POURING.
3. DUCT BANK REINFORCING BARS MUST OVERLAP BY 600mm.
4. SPARE DUCTS MUST BE FLUSHNESS AND A 6.7% mm (3/16") MINIMUM DIAMETER POLYPROPYLENE ROPE. ALL DUCTS TO HAVE THEIR ENDS CAPPED WITH AN APPROVED DUCT PLUG.
5. END OF ALL DUCT BANKS AND ROAD CROSSINGS SHALL BE MARKED WITH 1M CAT #765 1250 ELECTRONIC MARKERS.

SECONDARY DUCT BANK

MULVEY & BANANI

[redacted]

PROJECT

SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SHEET TITLE

ELECTRICAL DETAILS

PROJECT NO.
19-079 / 2020JN

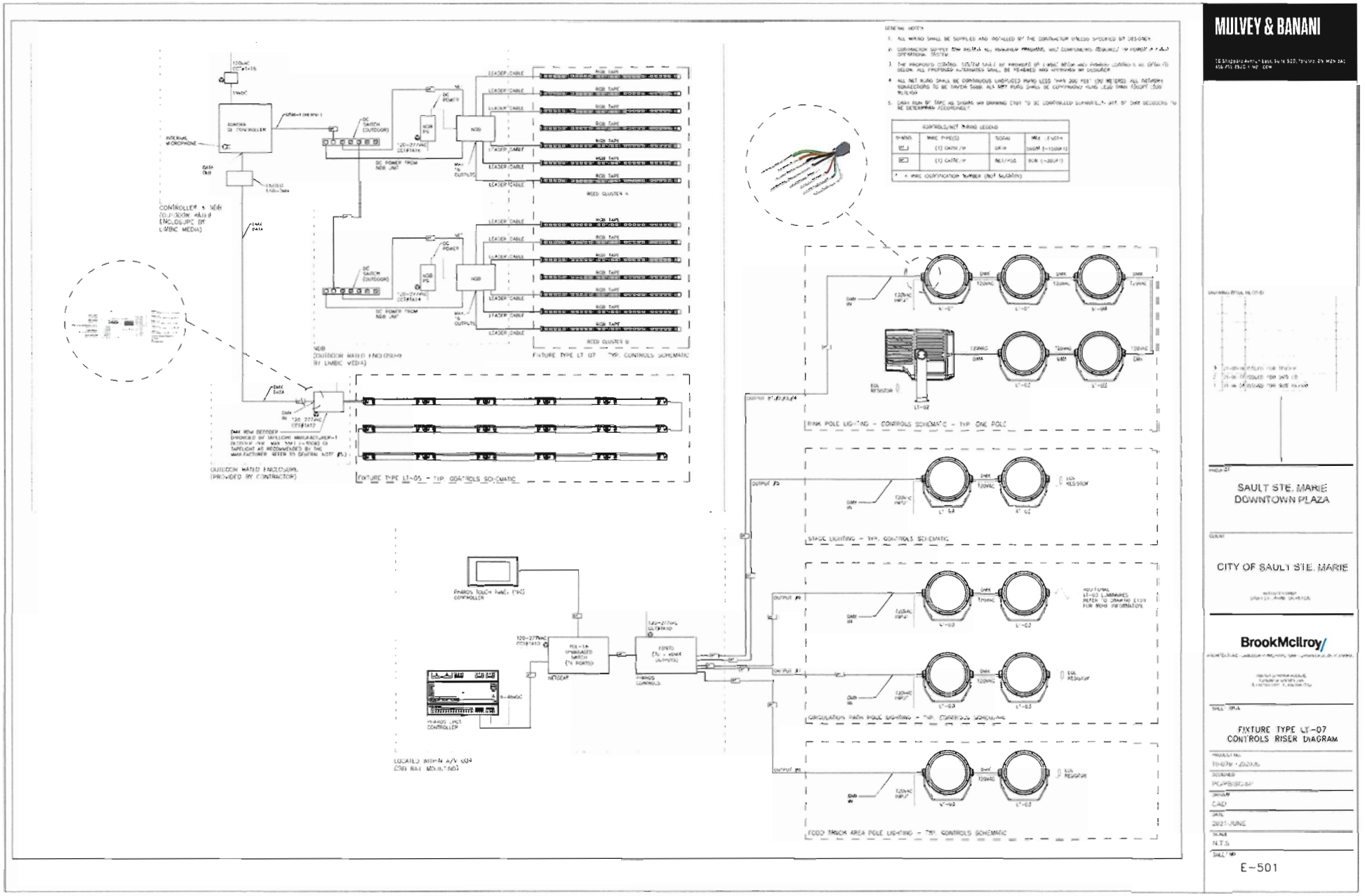
DESIGNED
PC/PP/SP/DH

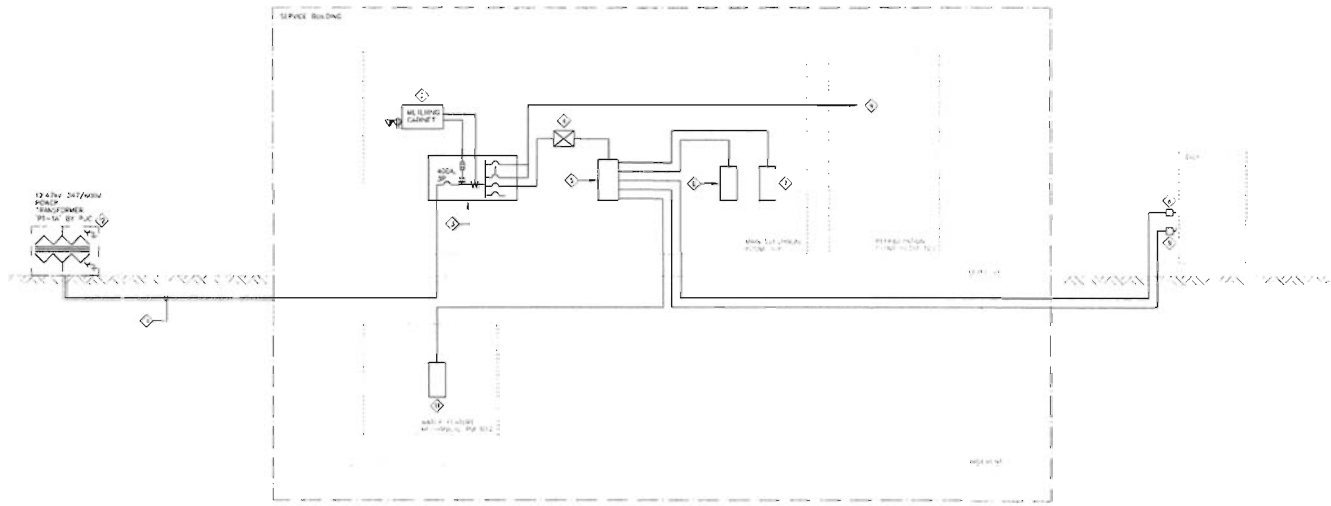
DRAWN
CAD

DATE
2021 JUNE

SCALE
AS SHOWN

SHEET NO.
E-600


MULVEY & BANANI
SAULT STE. MARIE
DOWNTOWN PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
FIXTURE TYPE LT-07
CONTROLS RISER DIAGRAM
CAD
2021-JUNE
N.T.S
E-501



GENERAL NOTES:

1. REFER TO PANELBOARD SCHEDULES in DRAWING E601 FOR SIZING OF CONDUITS AND WIRING UNLESS SHOWN ON THIS RISER DIAGRAM (NOT INCLUDED IN THIS PROGRESS ISSUE)

KEY NOTES (CONTINUED):

1. 400A, 347/600V, 3ø, 4W NORMAL SERVICE FEEDER TO BE ONE (1) RUN OF (4)500MCM-Cu) COPPER FEEDERS SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR (DIV. 26) IN SECONDARY CONDUIT & ENCASED DUCTBANK (SHOWN IN DETAIL NO. 1/A1000 FOR ELECTRICAL SECTION) TERMINATION OF POWER FEEDER AT POWER TRANSFORMER TO BE BY SAULT STE. MARIE PUC
2. METER PROVIDED BY LOCAL UTILITY METER BASE SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR IN ACCORDANCE TO LOCAL UTILITY STANDARD
3. 400A MAIN, 600V, 3ø, 4W SERVICE ENTRANCE SERVICE RATED TRIP C/W 400A 3P MAIN BREAKER.
4. 150kVA 600-120/208V DRY TYPE TRANSFORMER T1-1A MOUNTED ON FLOOR
5. 600A MAIN, 120/208V, 3ø, 4W POWER PANEL 'PP1-1PA'
6. 100A MAIN, 42-CKT, 120/208V, 3ø, 4W LIGHTING PANEL 'LP1-1A' FOR ALL LIGHT FIXTURES IN SERVICE BUILDING AND EXTERIOR LIGHTING
7. 100A MAIN, 42-CKT, 120/208V, 3ø, 4W RECEPTACLE PANEL 'RP1-1A1' FOR ALL 120V RECEPTACLE AND MISCELLANEOUS LOADS.
8. 60A, 120/208V, 3ø, 4W+G COMPANY SWITCH FOR ROOF LOAD
9. 100A, 120/208V, 3ø, 4W+G COMPANY SWITCH FOR STAGE LIGHTING
10. NOT USED.
11. 100A MAIN, 120/208V 3ø, 4W MECHANICAL PANEL 'MP1-1MA'
12. POWER TRANSFORMER (T1-1A TO BE PROVIDED BY SAULT STE. MARIE PUC. PRIMARY INCOMING SUPPLY AND TRANSFORMER (AS) TO BE PROVIDED BY PUC. GROUNDING OF TRANSFORMER INCLUDING TRIPLOAD RODS, TRIPLOAD WIRE LOOP & CONNECTORS, ETC. TO BE PROVIDED BY PUC SECONDARY POWER SUPPLY FROM THE TRANSFORMER TO BE BY ELECTRICAL CONTRACTOR

MULVEY & BANANI

[illegible]

PROJECT

SAULT STE. MARIE
DOWNTOWN PLAZA

CLIENT

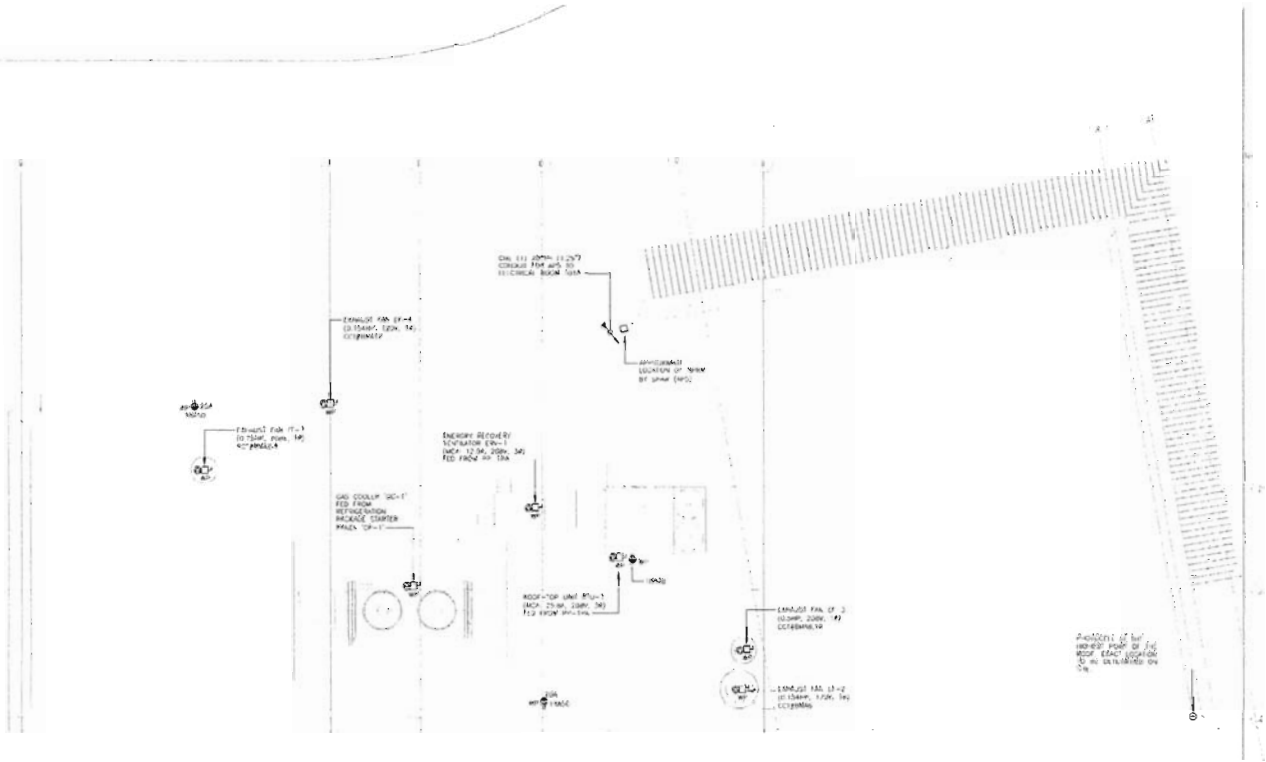
CITY OF SAULT STE. MARIE

BrookMcIlroy/

SHEET TITLE

POWER DISTRIBUTION SINGLE LINE RISER DIAGRAM

PROJECT NO.
19478 - 2020A
DESIGNED
PE/PB/SK/MP
DRAWN
CAD
DATE
JULY-JUNE
SCALE
N.T.S.
SHEET NO.
E-500



MULVEY & BANANI

SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

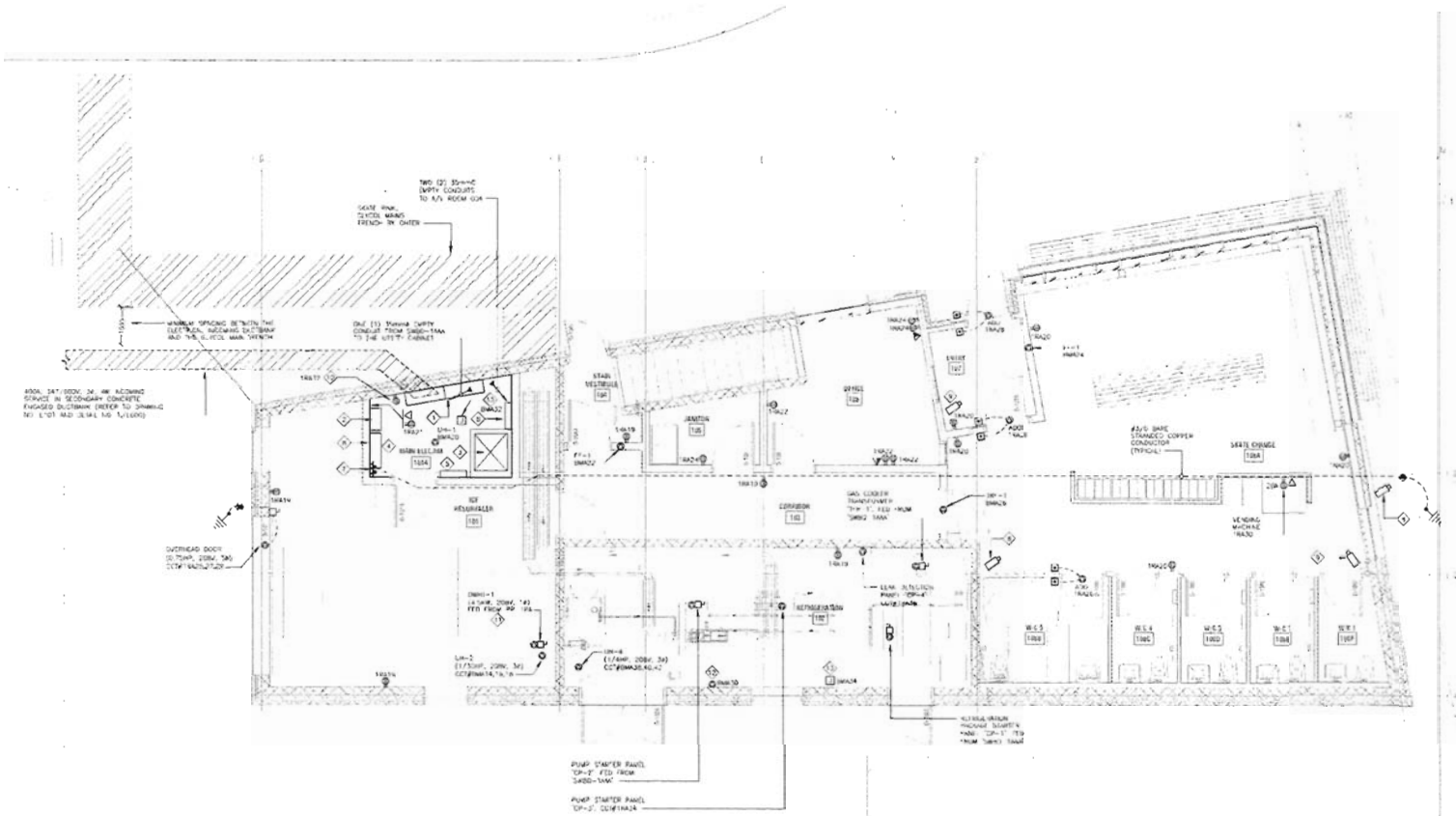
BrookMcIlroy/

SERVICE BUILDING ROOF -
ELECTRICAL

2021-JUNE

1:50'

E-303



NOTES

1. 400A MAIN, 347/600V, 3Ø, 4W, SERVICE ENTRANCE POWER PANEL "MAIN-1AA" (1800mm HIGH)
2. UTILITY CABINET
3. 150kVA, 600–120/208V TRANSFORMER "T-1A" MOUNTED ON 150mm HIGH CONCRETE PAD
4. 400A MAIN, 120/208V, 3Ø, 4W, POWER DISTRIBUTION PANEL "DP-1AA"
5. 120/208V, 3Ø, 4W, 42-CCT LIGHTING PANEL "LP-1A"
6. 120/208V, 3Ø, 4W, 42-CCT RECEPTACLE PANEL "RP-1AA"
7. 50mm(#4AWG)-(2)#4AWG+1(#4AWG) COPPER GROUND BAR C/W WALL MOUNTED INSULATION SPACERS FOR ELECTRICAL & IT EQUIPMENT
8. PLYWOOD BACKBOARD
9. SURVEILLANCE CAMERA PROVIDED AND INSTALLED BY OWNERS ELECTRICAL CONTRACTOR TO PROVIDE ONE (1) 27mm DIA EMPTY CONDUIT FROM THE CAMERA TO THE SURVEILLANCE SYSTEM RACK LOCATED IN THE SERVICE BUILDING. COORDINATE WITH SURVEILLANCE SYSTEM CONSULTANT/CONTRACTOR FOR EXACT LOCATION OF THE RACK
10. RECEPTACLE FOR SHWH WITH SYSTEM. COORDINATE WITH SHWH FOR EXACT LOCATION OF SHWH EQUIPMENT
11. ELECTRIC HOT WATER TANK TO BE SUPPLIED AND INSTALLED BY MECHANICAL. POWER CONNECTION TO BE BY ELECTRICAL CONTRACTOR
12. 600-T CONTINUITY GUARDBAR WITH MECHANICAL CONNECTOR FOR FENCE LOCATION PRIOR TO INSTALLATION
13. JUNCTION BOX WITH 15A, 120V, 1Ø DEDICATED CIRCUIT FOR MISCELLANEOUS MECHANICAL CONTROL

MULVEY & BANANI

SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SERVICE BUILDING GROUND FLOOR – POWER AND SYSTEMS

19-079 - 22/06/06

DESIGNED

DRAWN

CAD

DATE

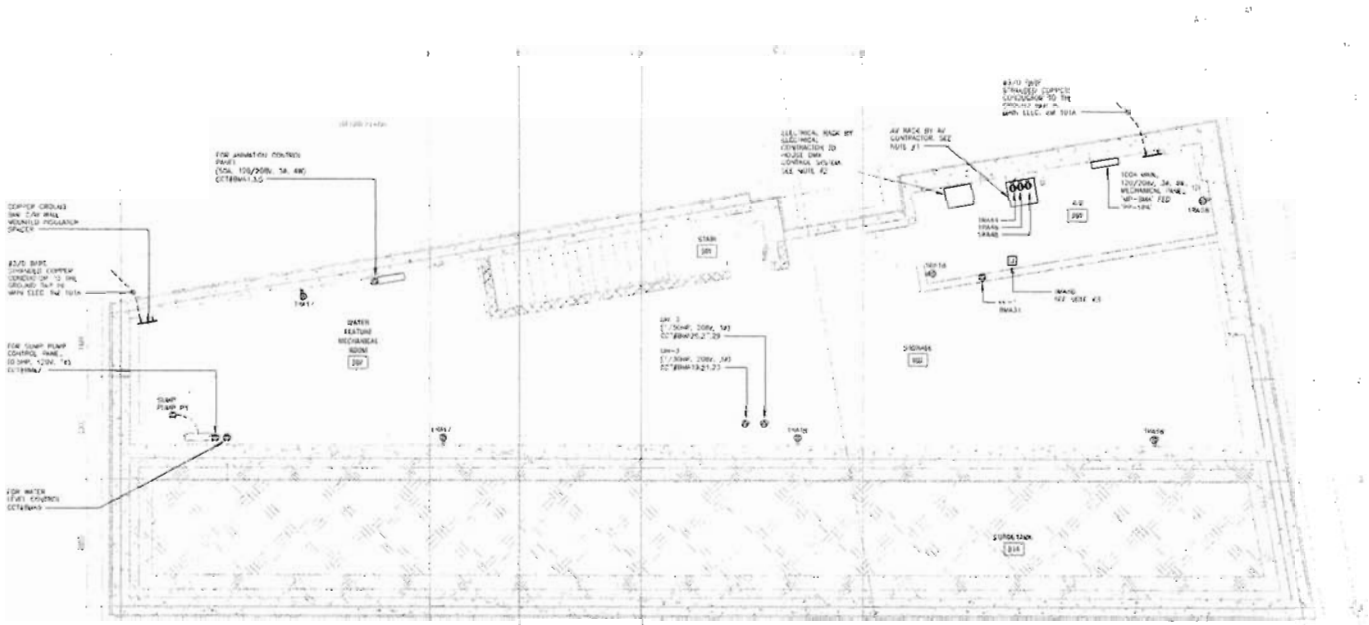
JUNE/JUNE

SCALE

1:50

DRAWING NO.

E-302



NOTES

1. ELECTRICAL CONTRACTOR TO PROVIDE ISOLATED GROUND "ENHANCED" TO EQUIPMENT RACK
2. ELECTRICAL RACK TO HOUSE DMX PHAZOS TOUCH PANEL CONTROLLER, LSP CONTROLLER AND ALL OTHER REQUIRED COMPONENTS AS DETAILED ON SHEET E201 AND AS MANUFACTURER RECOMMENDATIONS PER SPECIFIED DMX CONTROL AS TO PRODUCE A COMPLETE AND OPERATIONAL SYSTEM
3. [illegible] AS WITH 15A, 120V, "A" DEDICATED CIRCUIT FOR MODULATING MECHANICAL CONTROL

MULVEY & BANANI

SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SERVICE BUILDING BASEMENT – POWER AND SYSTEMS

CAD

1:50

E-301

KEY NOTES:

1. EMERGENCY BATTERY UNIT C/W UNIT MOUNTED DOUBLE HEAD LUMINAIRE (SEE SERIES CAPABILITY/SPEC) (STD)
2. WALL MOUNTED PLASTIC DOUBLE REMOTE EM LIGHT FIXTURE WITH TWO (2) 12V 5W LAMPS, RATED 5K2 (UNION DATA LUMPEL, WOW SERIES CATALOGUE/SPEC)
3. LIGHT FIXTURE TO BE CONTROLLED BY A COMMON PHOTOCELL AT THE ROOF
4. UNIVERSAL TYPE GREEN PICTOGRAM LED EXIT LIGHT WITH A MAXIMUM DEPTH OF 80mm (3.375"), EITHER SINGLE FACE RECESSED WALL MOUNT, OR RECESSED SOFFIT OR DOUBLE FACED CEILING MOUNT OR WALL END MOUNT. VOLTAGE 120V. EXIT SIGNS TO BE PROVIDED C/W STEM WHERE REQUIRED TO BE PENDENT TO ENSURE WITHIN LINE OF SIGHT

LUMAX - L - DE SERIES
EMPRESHEET - TSE SERIES
READY-LITE - XGE SERIES

MULVEY & BANANI

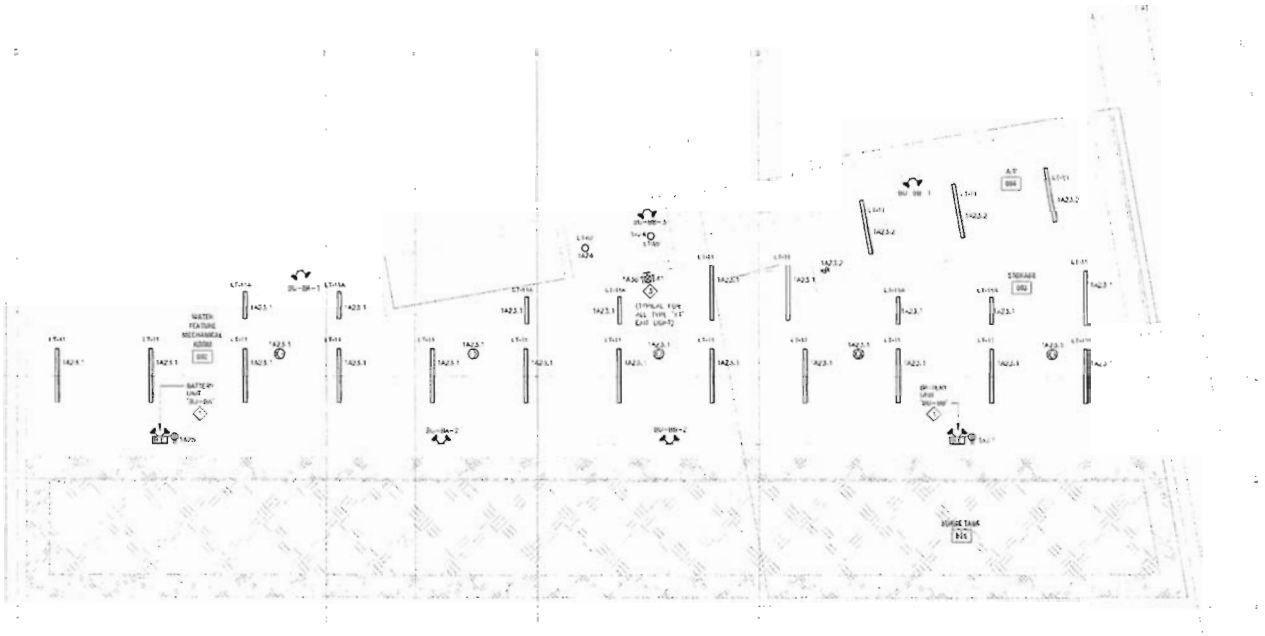
SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SERVICE BUILDING GROUND FLOOR – LIGHTING

PROJECT NO.
19-079 - 2020.00
DESIGNED
PLUMB/SHP
DRAWN
CAD
DATE
09:21 JUNE
SCALE
1:100
SHEET NO.
E-202



KEY NOTES:

1. EMERGENCY BATTERY UNIT C/W UNIT MOUNTED DOUBLE HEAD LUMIROLL RDS SERIES CAT#RDS1502S-L316
2. WALL MOUNTED PLASTIC DOUBLE REMOTE EM LIGHT FIXTURE WITH TWO (2) 12V 6W LAMPS RATED 542 LUMEN EACH. LUMACELL MDM SERIES CAT#MDM2-LED1
3. UNIVERSAL TYPE GREEN PICTOGRAM EXIT LIGHT WITH A MAXIMUM EFFECTIVE OF 30mm (1.375"), EITHER SINGLE FACE RECESSED WALL MOUNT OR RECESSED SINGLE OR DOUBLE FACED CEILING MOUNT OR WALL END MOUNT (ESTAR) 12.5 POWERED FOR 120 MINUTES, 120V, EXIT SIGNS TO BE PROVIDED C/W STEM WHERE REQUIRED TO BE PENDENT TO ENSURE WITHIN LINE OF SIGHT

LUMACELL - LSE SERIES
REMOTE-LITE - RDE SERIES
READY-LITE - RDE SERIES

MULVEY & BANANI

[redacted]

SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SERVICE BUILDING BASEMENT – LIGHTING

[redacted]

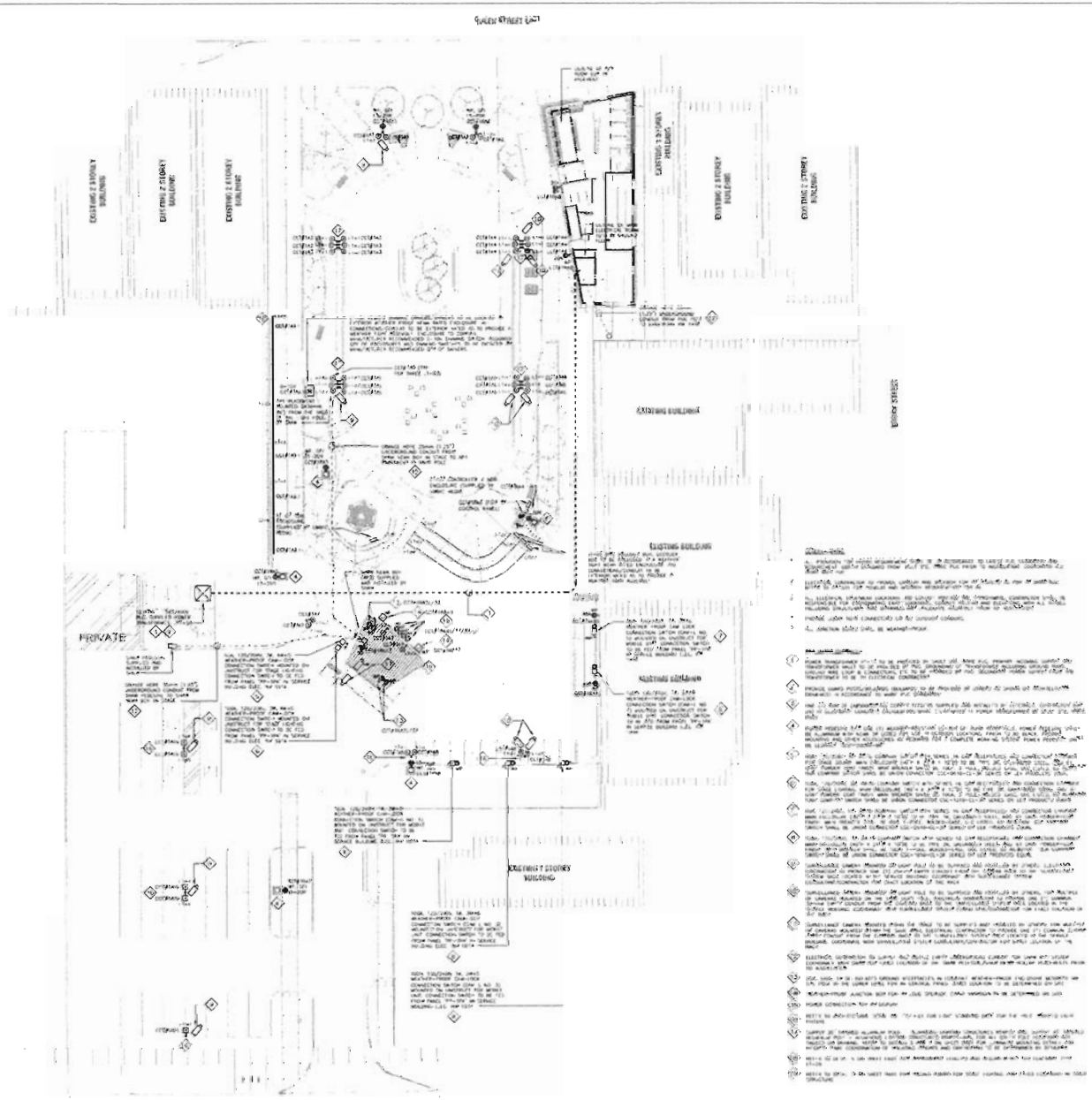
PS/PB-BS/SP

CAD

2021 JUNE

1:100

E–201



MULVEY & BANANI

SAULT STE. MARIE DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

SITE PLAN - ELECTRICAL

2021 JUNE

E-101

ELECTRICAL SPECIFICATIONS

1.0 GENERAL

1.1 WORK JOINT OCCUPANCY LIGHTING IN OPERATIONAL AND AS "NIGHT" THE ELECTRICAL CONTRACTOR IS TO MEASURE THE "AVERAGE" ILLUMINATION AT THE FLOOR (CFC) ALONG THE PRINCIPAL EGRESS ROUTES PROVIDING ACCESS TO EXITS. TAKE MULTIPLE READINGS ALONG THE PATHWAY AT AN APPROXIMATE INTERVAL NOT TO EXCEED 1' 0.0. THAT ALLOWS FOR MAXIMUM AND MINIMUM VALUES TO BE LOCATED AND RECORDED AT EXISTING HOSPITAL ON A CAD DWG. OR AS NOTED ON DRAWINGS FOR SUBMISSION TO THE CONSULTANT SUBMISSION TO THE BUILDING INSPECTION AUTHORITIES TO BE BY THE ELECTRICAL CONTRACTOR ADDITIONALLY, WHERE EMERGENCY LIGHTING IS ACHIEVED THROUGH UNIT EQUIPMENT CONFORMING TO CSA C22.2 NO. 141 (ELECTRICAL CONTRACTOR SHALL TEST THE RUNTIME OF ALL UNIT EQUIPMENT AND REPORT TO THE CONSULTANT IN WRITING, INCLUDE RUNTIME VERIFICATION IN CLOSEOUT DOCUMENTS).

1.1 WIRING AND BALANCING

1.1.1 MEGGER ALL POWER CIRCUIT FEEDERS. IF GROUND RESISTANCE ON ANY CIRCUIT IS LESS THAN 5 MEGOHMS BY CSA OR OTHER GOVERNING REGULATIONS, SUCH CIRCUITS ARE TO BE CONSIDERED DEFECTIVE AND MUST BE RECTIFIED.

1.1.2 MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS OPERATING AT 1/4, 1/2 AND FULL CAPACITY. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND SUBMIT A REPORT FOR ACCEPTION PRIOR TO ACCEPTANCE.

1.2 SERVICE EQUIPMENT

1.2.1 ALL NEW PANELBOARDS, DISCONNECT SWITCHES, MCC'S, TRANSFORMERS, ETC., TO BE POWER MANUFACTURED BRAND MOLDED CASE CIRCUIT BREAKERS TO BE INSTALLED. ALL SURFACE MOUNTED PANELBOARDS TO BE SPRINKLERPROOF. ONE OF THE FOLLOWING MANUFACTURER'S EQUIPMENT MUST BE PROVIDED:

SCHNEIDER
EATON
SIEMENS

1.2.2 ALL NEW PANELBOARDS SHALL BE COMPLETE WITH 250A RATED NEMA 3R

1.2.3 ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY.

1.2.4 DRY TYPE TRANSFORMERS SHALL BE MANUFACTURED TO CSA C22.2 NO. 47, ITA TO BAD CAPACITY CHECK AND SHALL MEET NATIONAL ENERGY AND ENHANCED EFFICIENCY ACT – ON 480/347V TO 120/208V/3PH, SHALL BE OF THE SAME MANUFACTURER AS THE BASE BUILDING UNIT WITH A DERATE K FACTOR OF 13 AND WITH ELECTROSTATICALLY SHIELDED, COPPER WINDINGS. PROVIDE 2.5% NOT 5% BELOW "TRANSFORMER NOTCHES FOR CONNECTION OF CABLES. "TRANSFORMER SHALL NOT BE "F" SEQT" TYPE. TRANSFORMER NOISE SHALL NOT TO EXCEED 45 TO 55 DEG. C IF UNABLE TO MATCH BASE BUILDING TRANSFORMER, ONE OF THE FOLLOWING MANUFACTURERS TRANSFORMERS MUST BE PROVIDED:

SCHNEIDER DELTA ACME HUBBELL ASEA
MARMOUD GE PLB

1.2.5 CLOSING MOUNT TRANSFORMERS UP TO 45 KVA WITH SPECIFICATION HOLES AND TERMINAL ISOLATORS. TRANSFORMERS 60 KVA AND ABOVE TO BE FLOOR MOUNTED ON VIBRATION ISOLATION PADS UNLESS OTHERWISE NOTED.

1.2.6 ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING TRANSFORMERS, PANELBOARDS AND SUB-DISTRIBUTION UNITS SHALL BE INSTALLED ON A 100MM (4") HIGH CONCRETE BASE TO EXTEND 50MM (2") ON ALL SIDES WITH CHAMFERED CORNERS. ALL CONCRETE WORK TO BE INCLUDED IN THIS DIVISION.

1.2.7 PROVIDE A CONCRETE SLAB 150MM (6") HIGH AT ALL SLEEVE LOCATIONS AND OPENINGS PENETRATING THE FLOOR SLAB. CONCRETE SHALL TO EXTEND 150MM (6") BEYOND THE EDGE OF THE SLEEVE OR CONDUIT. ALL CONCRETE WORK TO BE INCLUDED IN THIS DIVISION.

1.3 CABLE TROUGHS

1.3.1 CABLE TROUGHS AS DEFINED IN CSA C22.2, NO 126, ACCESSORIES AND FITTINGS SHALL BE MANUFACTURED TO SAME FILE

1.3.2 UNLESS OTHERWISE NOTED, PERMIT SYSTEMS CABLE TRAYS SHALL BE VENTILATED TYPE, CLASS 12A, WITHOUT COVER, SIZED AS INDICATED AND WITH A NATURAL FINISH.

1.3.3 UNLESS OTHERWISE NOTED, VOICE/DATA/AV/HUB ROOM CABLE TRAYS SHALL BE LADDER TYPE, PRE-GALVANIZED, CLASS 01, SIZED AS INDICATED AND WITH A NATURAL FINISH.

1.3.4 SUPPORTS SHALL BE 600 DAD CHANNEL OF A SIZE TO SUIT TOTAL LOAD. PROVIDE 25" BRACKETS TO BE INSTALLED AT EXTERIOR OF CABLE TRAYS TO PREVENT DAMAGE TO CABLES.

1.3.5 SUPPLY ALL BENDS, ELBOWS, END PLATES, DROP OUTS, TEES, WAYS AND REDUCERS. JOINTS FOR THE CHANNEL SHOULD BE FOLLOWED. PROVIDE PLASTIC GRIPS ON ALL SHARP EDGES WHERE CABLE CAN WHICH ARE USED TO JOIN BARRIER STRIPS AND FITTINGS.

1.3.6 REMOVE SHARP EDGES TO PREVENT CABLE DAMAGE OR INJURY TO PERSONNEL

1.3.7 PROVIDE GROUNDING FOR ALL CABLE TROUGHS AS PER THE C.E.S.C.

1.4 EXISTING WORK

1.4.1 IN ALL EXPOSED CEILING AREAS, ELECTRICAL CONTRACTOR IS TO REMOVE AND RELOCATE ALL EXISTING JUNCTION BOXES TO ACCESSIBLE CEILING SPACE

1.4.2 PROVIDE ACCESS PANELS FOR ALL NEW AND EXISTING DEVICES AS REQUIRED

1.5 BREAKERS

1.5.1 CHECK INTENDED SERVICE FOR ALL NEW AND EXISTING BREAKERS SERVING EXIT SIGNS, EMERGENCY LIGHTING AND EMERGENCY BATTERY PACKS.

1.5.2 PROVIDE 15A/1P G.F.I. BREAKER FOR ALL DUPLEX RECEPTACLES AND 15A/2P G.F.I. BREAKERS FOR ALL SPLIT RECEPTACLES INSTALLED WITHIN 3.0 METERS (24") OF SINK, SHOWER, ETC.

1.5.3 TANDEM BREAKERS SHALL NOT BE UTILIZED

1.6 FUSES

1.6.1 FUSES PROTECTING MOTOR LOADS, ELEVATORS AND TRANSFORMERS SHALL BE TIME DELAY, CURRENT LIMITING TYPE WITH 10 KA INTERRUPTING RATING MINIMUM AND SHALL BE CLASS J FOR 30 AMP AND INCLUDING 600A AND CLASS L FOR RATINGS ABOVE 600A.

1.6.2 FUSES PROTECTING SERVICE ENTRANCE AND FEEDER CIRCUITS SHALL BE FAST ACTING AND SHALL BE CLASS J FOR UP TO AND INCLUDING 600A AND CLASS L FOR RATINGS ABOVE 600A.

GENERAL NOTES

1 GENERAL

1.1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH DESIGN CONSULTANT DRAWINGS (ARCHITECTS DRAWINGS FOR DIMENSIONS, FINISHES AND MOUNTING HEIGHTS OF DEVICES, ETC.)

1.2 REFER ALSO TO MECHANICAL DRAWINGS FOR ADDITIONAL DETAILS.

2 LIGHTING

2.1 ALL LUMINAIRES INCLUDING EXIT DOWNLIGHTS AND PENDANTS, EXCLUDING EMERGENCY LUMINAIRES, WITHIN ONE "SMALL PREMISES" TO BE ON A SEPARATE LIGHTING ZONE AND TO BE CONTROLLED BY WALL BUILDING LIGHTING CONTROL SYSTEM UNLESS OTHERWISE NOTED. LUMINAIRES CIRCUITED TO BASE-BUILDING LUMINAIRES AT DEMISING PARTITIONS TO LEGIBLY LIGHTING ZONES ARE INDEPENDENTLY AVAILABLE TO TENANTS AND/OR TENANCY SPACES. PROVIDE ALL INTERLOCKS, RELAYS, CONTACTORS, X-RAY PANELS, AND ANY INTERFACE HARDWARE FOR SUCH CONTROL. CONTACT BASE BUILDING OPERATIONS TO COORDINATE LIGHTING CONTROL ZONES AND TIE-INS PRIOR TO CONSTRUCTION START.

2.2 EXIT LIGHTS SHALL BE COMPLETE WITH GREEN ILLUMINATED WITH PICTOGRAM. EXIT LIGHTS SHALL BE CERTIFIED TO CSA 22.2 NO 141-M, AND MEET CSA 22.2 NO 141-M, AND MEET CSA 22.2 NO 141-M, AND MEET

ELECTRICAL SPECIFICATIONS

GENERAL ELECTRICAL REQUIREMENTS

1 CODES & STANDARDS

1.1 COMPLY IN THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE, ONTARIO ELECTRICAL SAFETY CODE, CSA STANDARDS, I.E.S., N.F.P.A., O.H.S.A. AND OTHER CODES AS REQUIRED. COMPLY WITH ELECTRICAL AND BUILDING CODE LEGISLATION IN FORCE AT TIME OF BID SUBMISSION, WHILE NOT IDENTIFIED AND SPECIFIED BY NUMBER IN THIS DIVISION, THEY ARE TO BE CONSIDERED AS FORMING PART OF RELATED STANDARDS. ALSO, ALL ELECTRICAL WORK SHALL COMPLY WITH LANDLORD'S REQUIREMENTS AND RARE BUILDING STANDARDS. CONTRACTOR SHALL OBTAIN ALL LANDLORD'S REQUIREMENTS AND RARE BUILDING STANDARDS FROM THE LANDLORD DURING THE TENDER PERIOD.

2 EXISTING CONDITIONS

2.1 VISIT THE SITE AND EXAMINE THE EXISTING CONDITIONS AFFECTING THE WORK OF THIS DIVISION. NO CLAIM FOR EXTRA PAYMENT SHALL BE MADE FOR EXTRA WORK MADE NECESSARY BY CIRCUMSTANCES ENCOUNTERED IN DUE TO CONDITIONS WHICH WERE VISIBLE UPON OR REASONABLY INFERABLE FROM AN EXAMINATION OF THE SITE PRIOR TO SUBMISSION OF THE BID THAT WOULDVE HAD AN IMPACT. (SERVICES ABOVE CEILING)

2.2 BE AWARE THAT THERE MAY BE ASBESTOS FIBRES PRESENT IN VARIOUS FINISHES OR ON VARIOUS SURFACES IN CERTAIN AREAS OF THE BUILDING. ARRANGE WORK SO AS NOT TO DISTURB THESE MATERIALS. OR TAKE P.S. AND NECESSARY MEANS TO PROTECT ALL PERSONNEL FROM CONTACT WITH THEM. IN A WAY TO BE APPROVED BY THE LANDLORD. INCLUDE ALL COSTS ASSOCIATED WITH ANY REMEDIAL WORK, IN THE BID.

3 DEFINITIONS

3.1 WHEREVER THE WORDS "PROVIDE" OR "SUPPLY AND INSTALL", ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "PROVIDE AND INSTALL, INCLUSIVE OF ALL LABOUR, MATERIALS, ANTICIPATION, TESTING AND CONNECTIONS" FOR THE ITEM TO WHICH IT REFERENCES.

3.2 WHEREVER THE WORDS "EQUAL", "APPROVED", OR "APPROVED EQUAL" ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "EQUAL", "APPROVED", OR "APPROVED EQUAL" IN THE OPINION OF THE CONSULTANT ONLY.

4 MATERIALS AND EQUIPMENT

4.1 ALL MATERIALS AND EQUIPMENT SHALL BE NEW, CERTIFIED AS PER ESA/CSA OR AS APPROVED ON THE O.E.S.C. AND MANUFACTURED TO THE STANDARDS SPECIFIED.

4.2 WHERE THERE IS NO ALTERNATIVE TO SPECIFYING UNAVAILABLE ITEMS (IF NOT LISTED AS ITEM 7 SAFICAL) OR AS APPROVED BY THE O.E.S.C. OBTAIN "SPECIAL APPROVAL" FROM THE INSPECTION AUTHORITY.

5 PERMITS AND FEES

5.1 THE ELECTRICAL CONTRACTOR SHALL ACT AS THE OWNER'S AGENT IN ACCORDANCE WITH SECTION 2 OF THE O.E.S.C. AND SHALL IMMEDIATELY UPON AWARD OF CONTRACT, SUBMIT TO THE LOCAL ELECTRICAL INSPECTION AUTHORITY, THE NECESSARY NUMBER OF DRAWINGS FOR EXAMINATION, FINAL INSPECTION AND APPROVAL PRIOR TO THE COMMENCEMENT OF THE WORK, AND PAY ALL COSTS AND ASSOCIATED FEES. IF REQUIRED, PREPARE THE ROOFING DRAWINGS/DOCUMENTS REQUIRED BY THE AUTHORITY.

5.2 THE CONSULTANTS WILL PROVIDE UPON REQUEST, AT THE CONTRACTOR'S COST, THE REQUIRED QUALITY OF DRAWINGS.

5.3 WHERE SUPERVISION IS ACCEPTABLE FROM THE AUTHORITIES INSPECTION DEPARTMENT, NOTIFY COMMENCEMENT OF WORK.

6 CLEARANCE

6.1 WHERE AND WHEN IT IS NECESSARY TO PROVIDE TEMPORARY POWER, SHUT DOWN, ETC. WHICH WOULD POSSIBLY CAUSE SUBMIT BID FOR SUM AMOUNT ACCEPTABLE TO LANDLORD AND TENANT

7 CONTRACT DOCUMENTS

7.1 THE DRAWINGS FOR THE ELECTRICAL W

- $50.00 PER DRAWING FOR THE FIRST TO DRAWINGS
- $30.00 PER DRAWING FOR ADDITIONAL DRAWINGS 11 THROUGH 20
- $150.00 FOR 20 DRAWINGS OR MORE

7.4.1 INCORPORATE ALL CHANGES AND REVISIONS FROM SHOP DRAWINGS, LETTERS, MEMOS, MEMORANDUMS DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODS USED

7.4.2 ALL MAIN BRANCH CONDUIT RUNS, JUNCTION BOX LOCATIONS, CONDUIT RUNS FOR ALL FLOOR OUTLETS, ETC., MUST BE REFLECTED ON THE DRAWINGS

7.4.3 REMOVE THE ELECTRICAL ENGINEER'S STAMP FROM ALL RECORD DRAWINGS

7.4.4 ENSURE THE MULVEY AND BANANI LOGO REMAINS ON ALL RECORD DRAWINGS

MULVEY & BANANI

33 Bloor St E Avenue East, Suite 520, Toronto, ON M4W 3A2
416 751 2520 | mby.com

SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy/

ELECTRICAL SPECIFICATION

19-076 / 2020

DESIGNED
PC/PB/RJ/NP

DRAWN
CAD

DATE
JUNE 2021

SCALE
N.T.S.

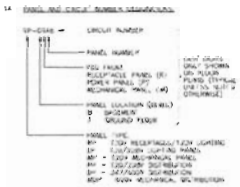
E-002

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DISTRIBUTION TRANSFORMER REFER TO DISTRIBUTION RISER DIAGRAM FOR KVA RATING, OR AS NOTED. REFER TO SPECIFICATIONS FOR A-TYPING		8'-0" LINEAR LUMINAIRE
	SINGLE-GANG WALL MOUNTED DATA OUTLET BOX C/W 19mmØ CONDUIT FROM BOX TO THE NEAREST TELECOM ROOM, UNLESS OTHERWISE NOTED.		4'-0" LINEAR LUMINAIRE
	SINGLE-GANG WALL MOUNTED DATA OUTLET BOX C/W 19mmØ CONDUIT FROM BOX TO THE NEAREST TELECOM ROOM, UNLESS OTHERWISE NOTED.		4'-0" RECEPTACLE LINEAR LUMINAIRE
	SINGLE GANG OF TWO GANG COMBINATION VOICE/DATA OUTLET BOX C/W 19mmØ CONDUIT FROM BOX TO THE NEAREST TELECOM ROOM, UNLESS OTHERWISE NOTED		WALL MOUNTED SCONCE LUMINAIRE
	JUNCTION BOX		LED LIGHTING
	POWER TRANSFORMER		RECESSED DOWNLIGHT LUMINAIRE
	CURRENT TRANSFORMER		WALL MOUNTED LUMINAIRE
	POTENTIAL TRANSFORMER		CEILING MOUNTED LUMINAIRE
	DIRECT CONNECTION OUTLET (WHERE DIRECT CONNECTION TO EQUIPMENT TERMINALS)		POLE MOUNTED LUMINAIRE
	SINGLE PHASE MOTOR CONNECTION		LUMINAIRE DESIGNATOR LETTER DENOTES LUMINAIRE TYPE. REFER TO LUMINAIRE SCHEDULE.
	THREE PHASE MOTOR CONNECTION		LED LIGHT - WALL OR CEILING MOUNTED AS SHOWN, ARCHITECTURAL (DECORATIVE) ILLUMINAIRE UNLESS NOTED OTHERWISE INDICATE ILLUMINAIRE TYPE
	COMBINATION MAGNETIC STARTER W/ MECHANICAL BYPASS		LIGHT SWITCH - SINGLE POLE, 120 VOLT OR 347 VOLT AS REQUIRED
	VARIABLE FREQUENCY DRIVE W/ MECHANICAL BYPASS		3-WAY LIGHT SWITCH - SINGLE POLE, 120 VOLT OR 347 VOLT AS REQUIRED
	DISCONNECT SWITCH		1-GANG LOCAL (STAND-ALONE) 0-10V DIMMER SWITCH TO PROVIDE INDIVIDUAL AND DIRECT ADDRESS OF LED LIGHTING DIMMER SWITCH TO BE C-A LIGHT (CAT. LINEAR SLOPE ALLOWING FINE ADJUSTING OF LIGHT LEVEL DATA FLOW DIMMING RANGE AND DELIVERY POWER STRIP PACKET WITH WALL-BOX DIMMER. ON FINISH AREA TO BE CONFIRMED BY ARCHITECTS DURING SHOP DRAWING. SWITCH SHALL BE LUTRON DIVA SERIES (DVSCFX-XX SERIES) OR ACUITY SYNERGY OR LEVITON DECORA, OR MULTIPOINT APPROVED EQUAL. CONTRACTOR TO PROVIDE ALL REQUIRED WIRING FROM SWITCH TO 0-10V DIMMABLE LED DRIVER AS INDICATED IN DRAWER CUT SHEET/INSTALLATION INSTRUCTIONS.
	FUSED DISCONNECT SWITCH		
	MECHANICALLY INTERLOCKED (4-WAY) AND DOUBLE-THROW (DPDT) MAINTAINED SPST 20A 277 VOLT RATED SWITCH FOR MANUAL OVERRIDE OF OCCUPANCY SENSOR. REFER TO SPECIFICATIONS FOR TYPE.		CEILING MOUNTED OCCUPANCY MOTION SENSOR REFER TO SPECIFICATIONS FOR TYPE.
	SINGLE PHASE MOTOR CONNECTION COMPLETE WITH DISCONNECT		OUTDOOR RATED SURFACE MOUNTED DAYLIGHT PHOTOCELL
	THREE PHASE MOTOR CONNECTION COMPLETE WITH DISCONNECT		EMERGENCY BATTERY UNIT C/W TWO WALL MOUNTED SQUARE HEAD
	PLUG-IN TYPE FUSED DISCONNECT SWITCH		WEATHER DOUBLE HEAD EMERGENCY LAMP UNIT WALL MOUNTED
	EMPTY CONDUIT		REMOTE SINGLE HEAD EMERGENCY LAMP UNIT WALL MOUNTED
	GROUND ROD		WALL MOUNTED DUPLEX RECEPTACLE (1.2kW, 120V UNLESS OTHERWISE NOTED)
	CADWELD CONNECTION POINT		WALL MOUNTED DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER (1.2kA, 120V UNLESS OTHERWISE NOTED)
	GROUND ROD		WALL MOUNTED DUPLEX GFI RECEPTACLE (15A/125, 120V UNLESS OTHERWISE NOTED)
	SURVEILLANCE CAMERA (PROVIDED AND INSTALLED BY OTHERS)		WALL MOUNTED DUPLEX GFI RECEPTACLE MOUNTED ABOVE COUNTER (15A, 120V UNLESS OTHERWISE NOTED)
	ADDITIONAL GENERAL ABBREVIATIONS		WALL MOUNTED QUAD RECEPTACLE (15A/125V UNLESS OTHERWISE NOTED)
AFF	ABOVE FINISHED FLOOR		WALL MOUNTED DUPLEX RECEPTACLE WITH ISOLATED GROUND SPLIT-WIRING (15A/125V UNLESS OTHERWISE NOTED)
AFF	ABOVE FINISHED FLOOR		WALL MOUNTED QUAD RECEPTACLE WITH ISOLATED GROUND SPLIT-WIRING (15A/125V UNLESS OTHERWISE NOTED)
ACB	AUTOMATIC CIRCUIT BREAKER		
GFI	GROUND FAULT INTERRUPTER		
kV	KILOVOLTS		

CIRCUIT KEY

1A PANEL AND CIRCUIT NUMBER DESIGNATIONS



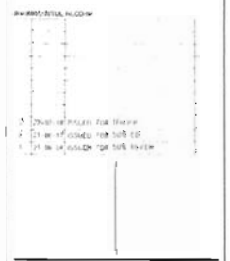
1B TRANSFORMER DESIGNATIONS

DRAWING LIST

E-001 LEGEND AND DRAWING LIST
E-002 ELECTRICAL SPECIFICATION
E-003 ELECTRICAL SPECIFICATION
E-101 SITE PLAN - ELECTRICAL
E-201 SURFACE BUILDING BASEMENT - LIGHTING
E-202 SURFACE BUILDING GROUND FLOOR - LIGHTING
E-203 SURFACE BUILDING BASEMENT - POWER AND SYSTEMS
E-204 SURFACE BUILDING GROUND FLOOR - POWER AND SYSTEMS
E-301 SURFACE BUILDING ROOF - ELECTRICAL
E-501 POWER DISTRIBUTION RISER
E-502 DATA RISER DIAGRAM
E-601 ELECTRICAL DETAILS
E-602 ELECTRICAL DETAILS
E-603 ELECTRICAL DETAILS
E-604 PANELBOARD SCHEDULES
E-605 PANELBOARD SCHEDULES

MULVEY & BANANI

LONDON 33 Bloomsbury Avenue, London, England, WC1B 3QJ T: +44 (0)20 7631 1340



SAULT STE. MARIE
DOWNTOWN PLAZA

CITY OF SAULT STE. MARIE

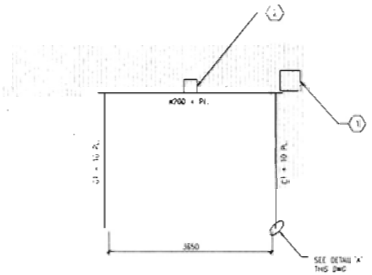
BrookMcIlroy/

LEGEND AND DRAWING LIST

PROJECT NO.	19-079 - 402.05
DRAWN	PC/PB/DC/SP
CHKD	CMH
DATE	2021-JUNE
SCALE	N.T.S.
SHEET NO.	E-001

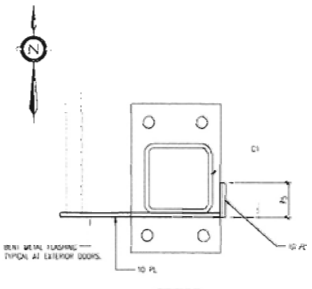
LEGEND

1. DOOR OPERATOR PLATE PL 450 x 10 PL x 450 c/w L75 x 75 x 8 OUTRIGGER ANGLES. OPERATOR PL TO BE FLUSH WITH INTERIOR FACE OF DOOR FRAME.
2. PL 300 x 10 x 300 INTERIOR FACE OF PLATE TO BE FLUSH WITH INTERIOR FACE OF CHANNEL FRAME TYPICAL AT O/H DOOR



WEST ELEVATION

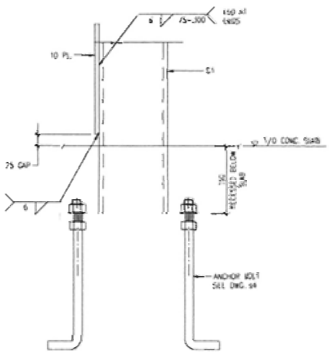
SCALE 1:50



DETAIL A

SCALE 1:5

PLAN



TYP. BASE DETAIL

SCALE 1:5

ELEVATION

ISSUED FOR TENDER & PERMIT
FEBRUARY 28 2022

KEY PLAN

DATE	REV.	REVISION	BY	APP'D
22 02 25	0	ISSUED FOR TENDER & PERMIT	BWJ	ZP

ENGINEER'S SEAL

CLIENT:
SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

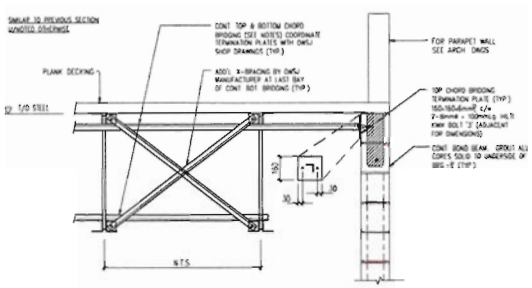
CONSULTANT:
TULLOCH ENGINEERING

DRAWING TITLE:
SERVICE BUILDING
STRUCTURAL - O/H DOOR
SECTIONS & DETAILS

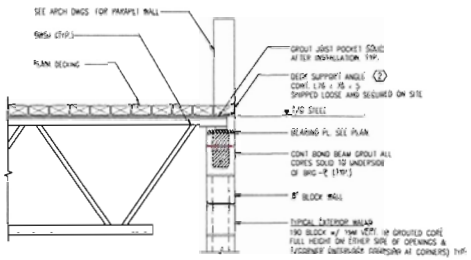
DRAWN	DESIGNED	CHECKED	APPROVED
BWJ	ZP	DJM	ZP

SCALE	DATE
As Noted	AUGUST 2021

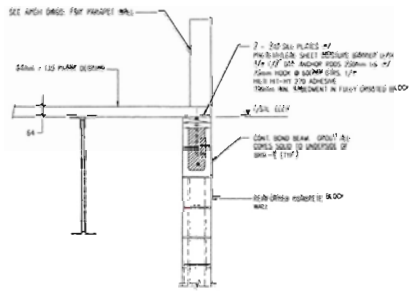
PROJECT No.	REVISION	DRAWING
191866	0	S10



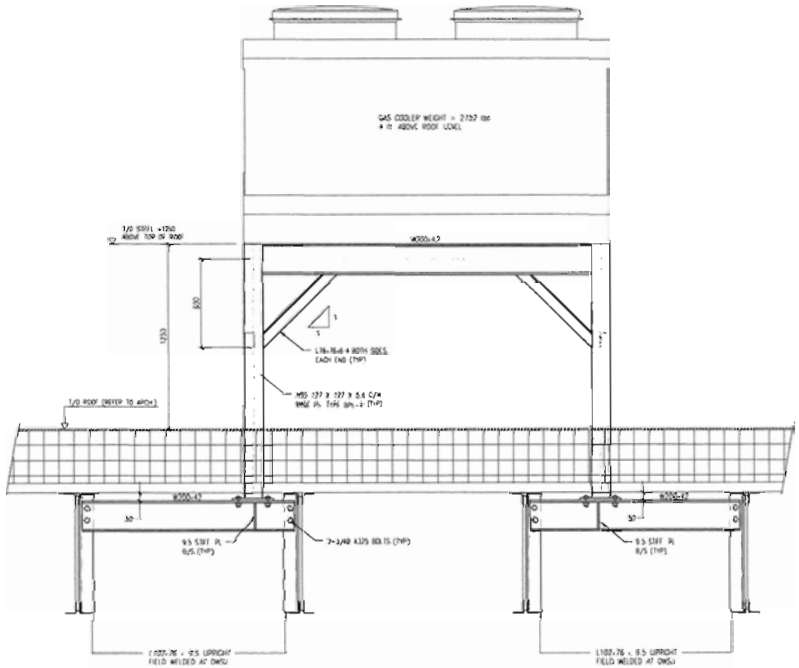
DETAIL 4/S7
SCALE: 1:15



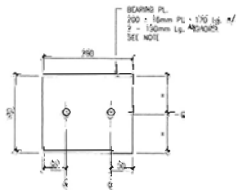
SECTION 9/S7
SCALE: 1:15



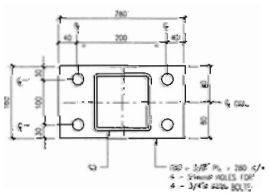
SECTION 4/S5
SCALE: 1:15



SECTION 4/S5
SCALE: 1:15



BEARING PL. – BP1
SCALE: 1:5
PLAN



BASE PL. – TYPE BPL-2
SCALE: 1:5
PLAN

ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2021

KEY PLAN

DATE	REV.	REVISION	BY	APP'D

ENGINEER'S SEAL:

CLIENT:
SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

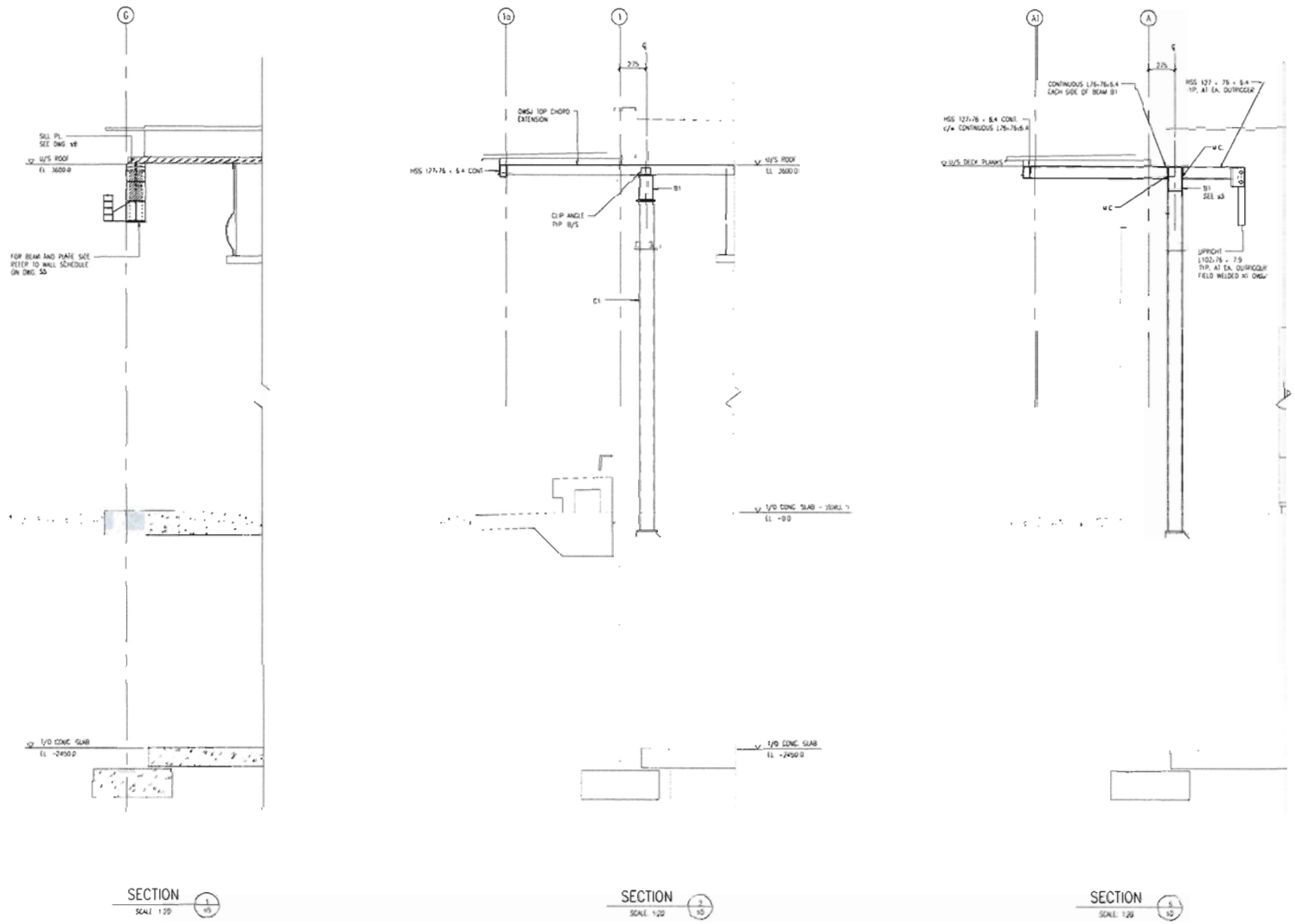
CONSULTANT:
TULLOCH ENGINEERING

DRAWING TITLE:
SERVICE BUILDING
STRUCTURAL
ROOF
SECTIONS AND DETAILS

BWJ	ZP	DJM	ZP
DRAWN	DRAWING NO.	CHECKED	APPROVED

As Noted — SCALE
AUGUST 2021 — DATE

191866	0	s9
PROJECT No.	REVISION	DRAWING



SECTION 1/S5 — SCALE 1:20

SECTION 2/S5 — SCALE 1:20

SECTION 3/S5 — SCALE 1:20

ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2022

KEY PLAN

DATE	REV	REVISION	BY	APP'D
22.02.25	0	ISSUED FOR TENDER & PERMIT	BWJ	ZP

ENGINEER'S SEAL:

LICENSED PROFESSIONAL ENGINEER
Z. A. PRIDE
100528303
PROVINCE OF ONTARIO

OWNER:

SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

CONSULTANT:

TULLOCH ENGINEERING

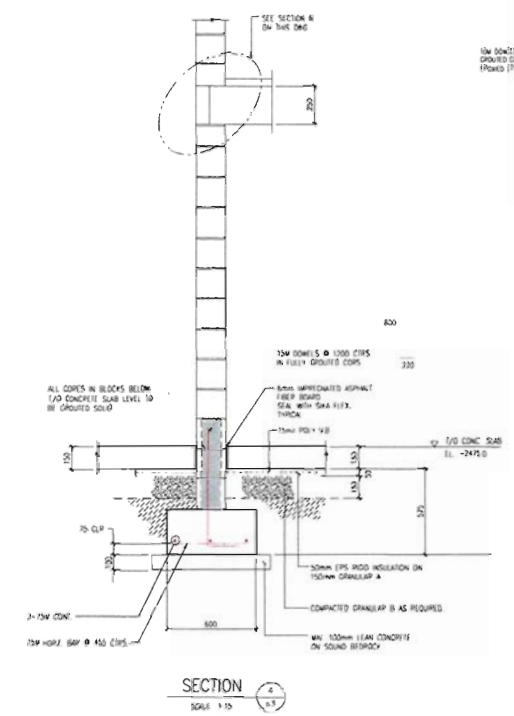
DRAWING TITLE:

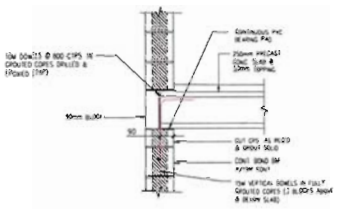
SERVICE BUILDING
STRUCTURAL
BUILDING SECTIONS

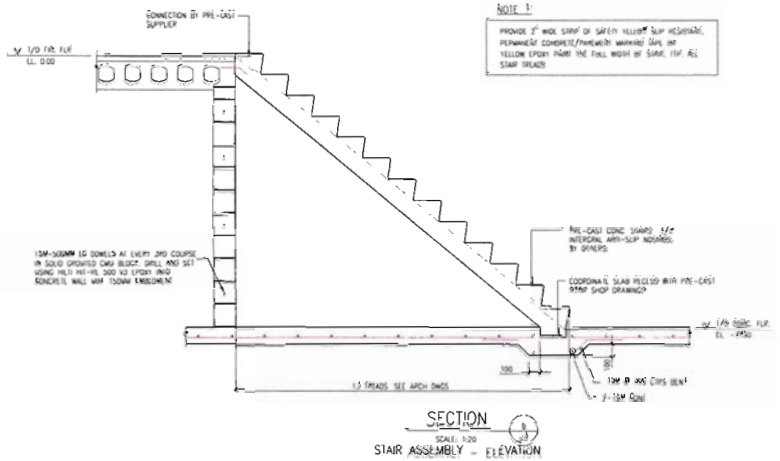
BWJ	ZP	DJM	ZP
DRAWN	DESIGNED	CHECKED	APPROVED

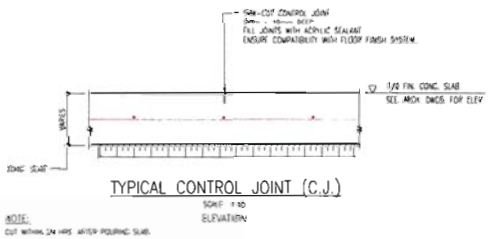
As Noted — SCALE
AUGUST 2021 — DATE

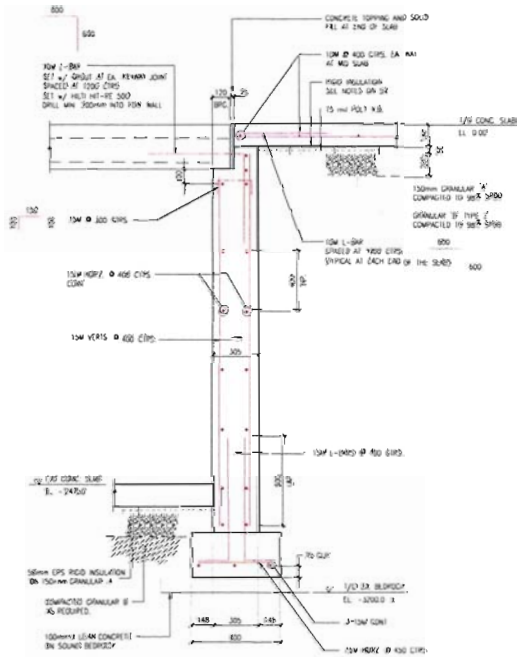
191856	0	s8
PROJECT No.	REVISION	DRAWING

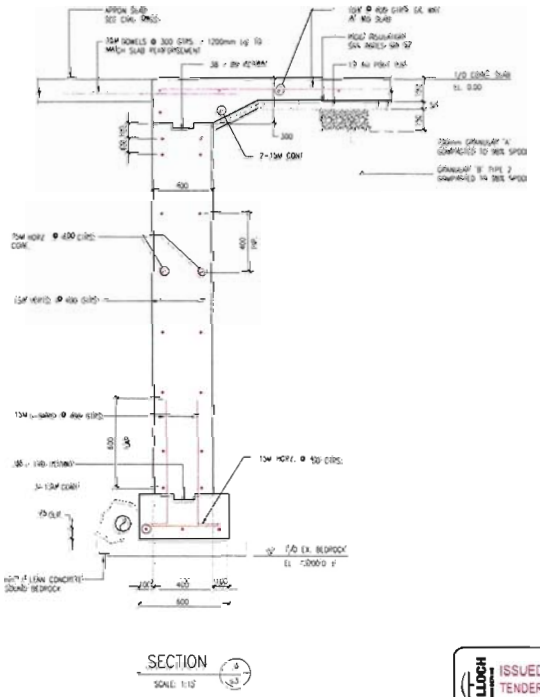












ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2022

KEY PLAN

DATE	No.	ISSUED FOR TENDER & PERMIT	BWJ	ZP
	REV.	REVISION	BY	APP'D

ENGINEER'S SEAL:

SCHEME:
SAULT STE.MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

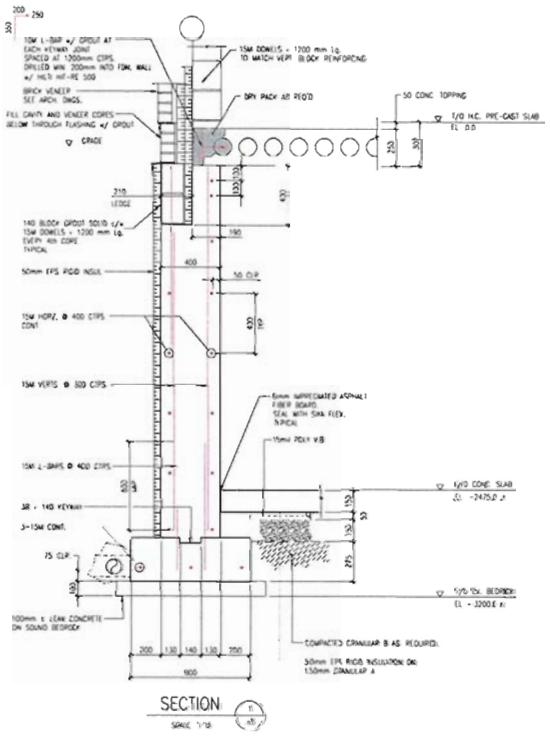
CONSULTANT:
TULLOCH ENGINEERING

DRAWING TITLE:
SERVICE BUILDING
STRUCTURAL
FOUNDATION SECTIONS

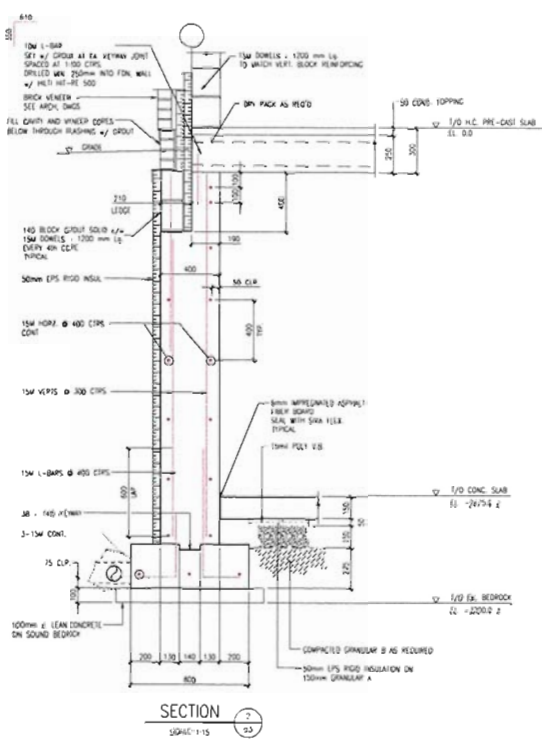
DRAWN	DESIGNED	CHECKED	APPROVED
BWJ	ZP	DJM	ZP

SCALE: As Noted
DATE: AUGUST 2021

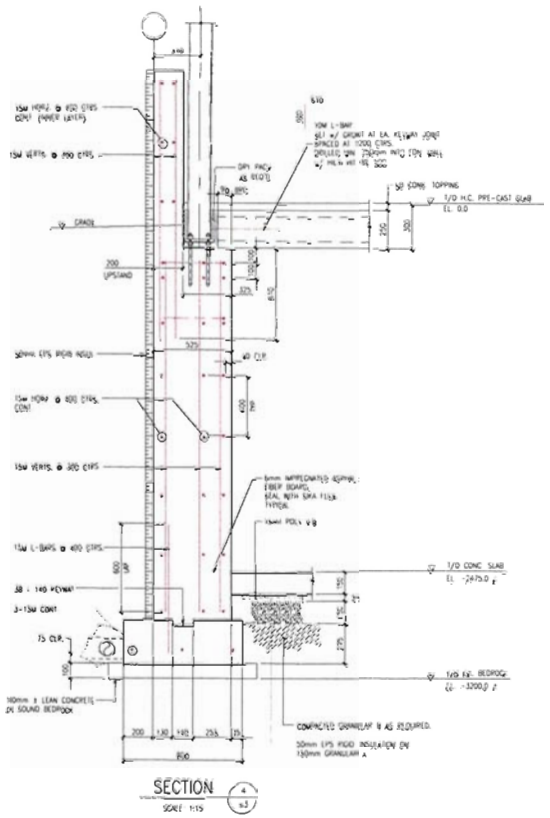
PROJECT NO.	DRAWING NO.	REVISION
191866	S7	0



SECTION 1
SCALE: 1:15



SECTION 2
SCALE: 1:15



SECTION 4
SCALE: 1:15

KEY PLAN

DATE	REV.	REVISION	BY	APP'D
21 FEB 26	5	ISSUED FOR TENDER & PERMIT	BWJ	ZP

ENGINEER'S SEAL

CLIENT:
SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

TULLOCH ENGINEERING

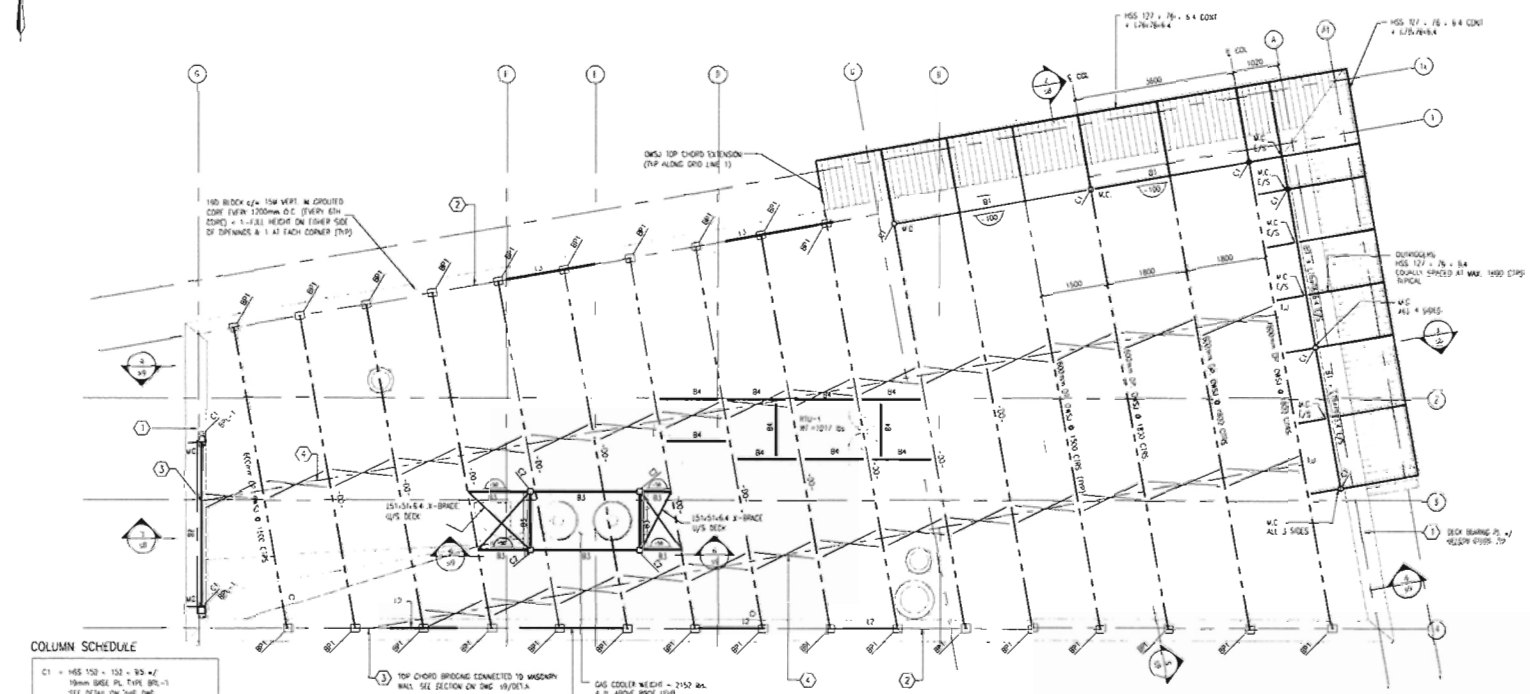
DRAWING TITLE:
SERVICE BUILDING
STRUCTURAL
FOUNDATION SECTIONS

BWJ	ZP	DJM	ZP
DRAWN	DESIGNED	CHECKED	APPROVED

As Noted	AUGUST 2021
SCALE	DATE

191866	0	S6
PROJECT No.	REVISION	DRAWING

ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2026



ROOF PLAN

SCALE: 1:50

FOR I/O STEEL ELEV. REFER TO ARCH. DWGS

COLUMN SCHEDULE

C1 = HSS 150 × 152 × 9.5 c/w 19mm BASE PL TYPE BPL-1 SEE DETAIL ON THIS DWG.

C2 = HSS 127 × 127 × 9.4 c/w BASE PL TYPE BPL-2 (see dwg s9)

BEAM SCHEDULE

B1 = HSS 254 × 152 × 9.4

B2 = W200 × 31

B3 = W200 × 42

B4 = C280 × 17

LINTEL SCHEDULE

L1 = 2L 76×76 × 6.4 × 189-89 × 6.4

L2 = 2L 102×76 × 6.4 LLH × 189-89 × 9.4

L3 = 2L 127×76 × 9.5 LLH

BRACING 'X' BRACING REQUIRED ALL OTHER REQUIRED BRACING MAY BE HORIZONTAL DESIGNED BY JOIST MANUFACTURER

WALL SCHEDULE

WALL TYPE	DESCRIPTION	SSOF DRWNG	REMARKS	DETAIL
EXTERIOR 190 BLOCK w/ 90 BRICK	WOOD = 31 w/ 19mm SIM PLY (1400mm@) 1/4" DIAMOND PL's @ 1/3 POINTS w/ CONN. 189 - 89 - 9.4. 140-150kg NELSON STUDS @ 600 CTRS	3850mm	MIN. 150mm BEARING	

LEGEND

1. 2 - 2x8 SILL PLATES w/ POLYETHYLENE SHEET MOISTURE BARRIER U/S 1/2" DIA ANCHOR RODS 230mm c/s w/ 75mm HOOK @ 600mm CTRS. w/ FULLY GROUTED BLOCK
2. CONT. L76 × 76 × 5 ONSF SUPPORT ANGLE SHOPPED 100SK and SECURED ON SITE
3. TOP CHORD BRIDGING TERMINATION PLATE SEE SECTION ON DWG. s9 FOR DETAILS COORDINATE WITH OWSJ SHOP DRAWINGS (ALL LOCATIONS ARE NOT SHOWN FOR CLARITY)
4. BOT CHORD BRIDGING TERMINATION PROVIDE ADDITIONAL X-BRACING TYPICAL (BY OWSJ MANUFACTURER) at 2ND LAST BAY TO TRANSFER LOADS FROM BOTTOM CHORD TO TOP CHORD. EXTEND BOTTOM CHORD BRIDGING 100mm BEYOND LAST OWSJ. SEE DETAIL "A" ON DWG. s9 FOR DETAILS & COORDINATE WITH OWSJ SHOP DRAWINGS (ALL LOCATIONS ARE NOT SHOWN FOR CLARITY)

WS = FIELD WELDED WEAKAXIS CONNECTION

T.J. = TIE JOIST

BP1 = BEARING PL SEE DWG s9 FOR DETAIL

ISSUED FOR TENDER & PERMIT FEBRUARY 25 2022

KEY PLAN

02 FEB 25	0	ISSUED FOR TENDER & PERMIT	BWJ	ZS
DATE (YY/MM/DD)	REV.	REVISION	BY	APP'D

ENGINEER'S SEAL:

CLIENT:

SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

CONSULTANT:

TULLOCH ENGINEERING

DRAWING TITLE:

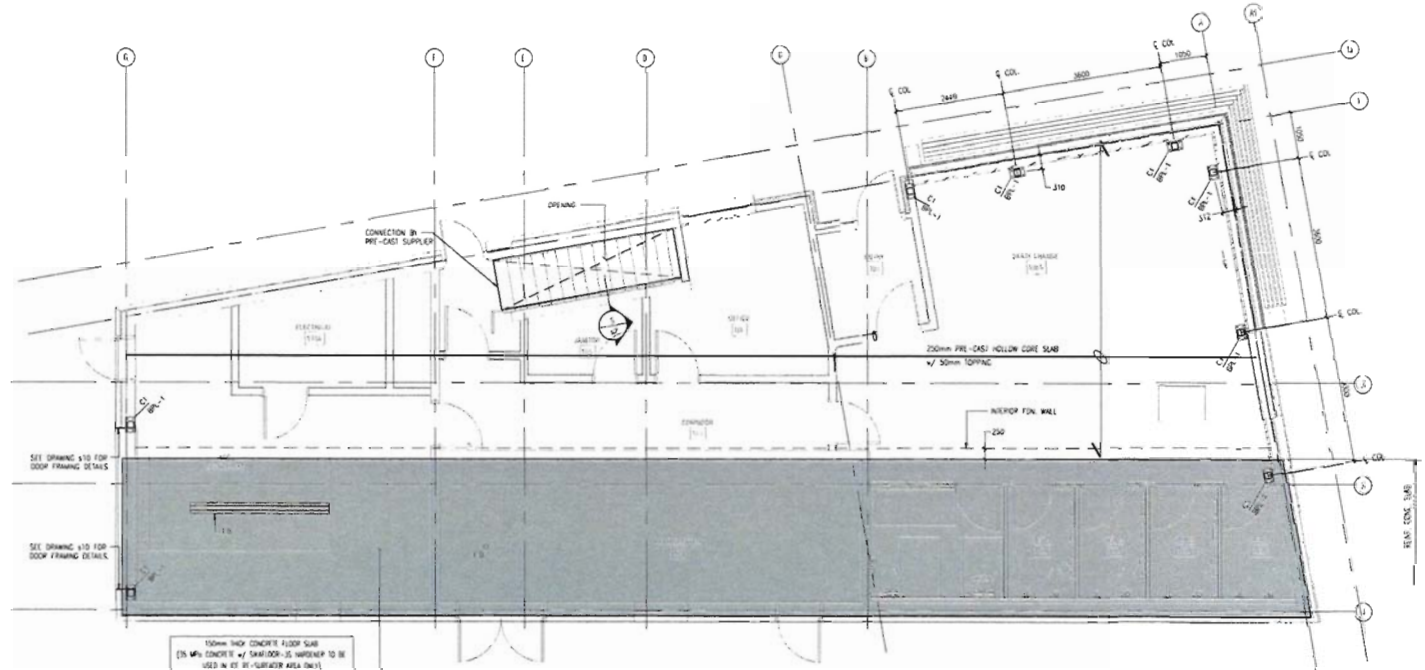
SERVICE BUILDING
STRUCTURAL
ROOF PLAN

DRAWN	DESIGNED	CHECKED	APPROVED
BWJ	ZS	DJM	ZS

SCALE: As Noted

DATE: AUGUST 2021

PROJECT No.	REVISION	DRAWING
191866	0	s5



GROUND FLOOR – FRAMING PLAN

SCALE: 1:50

COLUMN SCHEDULE

C1 = HSS 152 x 152 x 9.5 w/ 19mm BASE PL. TYPE BPL-1 SEE DETAIL ON THIS DWG.

LEGEND

FD = PRE MANUFACTURED FLOOR DRAIN

TD = PRE MANUFACTURED TRENCH DRAIN

GROUND FLOOR LOADS:

LIVE LOAD: = x lb/ft²

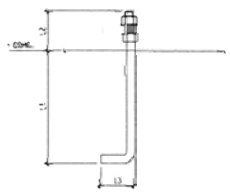
DEAD LOADS:

-FLOOR FINISH = 12.25kPa

-250mm HOLLOW CORE w/ 50mm TOPPING = 4.42kPa

= 5.67kPa

150mm THICK CONCRETE FLOOR SLAB (35 MPa CONCRETE w/ SHAKE-ON-IS HARDENER TO BE USED IN ST. BY-LAWATOR AREA ONLY) 15M @ 400mm O.C. EACH WAY, MID SLAB ON 15 mil POLY VAPOUR BARRIER ON 150mm EPS XPS INSULATION ON 150mm COMPACTED GRANULAR 'A' ON COMPACTED GRANULAR 'B' BACKFILL ALL GRANULAR FILL TO BE COMPACTED TO 98% STANDARD PROCTOR DENSITY MAXIMUM 300mm LAYERS OF LOOSE MATERIAL SEE KEY PLAN FOR URBAN EL



TYPICAL ANCHOR BOLT

SCALE: 1:10

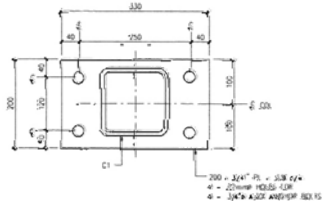
ANCHOR BOLT SCHEDULE			
DIAMETER	L1	L2	L3
3/4" DIA	250	50	100

LEGEND

L1 = LENGTH

L2 = PROJECTION

L3 = HOOK



BASE PL. – TYPE BPL-1

SCALE: 1:2

PLAN

ISSUED FOR TENDER & PERMIT

FEBRUARY 25 2022

KEY PLAN

DATE	REV.	REVISION	BY	APP'D
22 02 25	0	ISSUED FOR TENDER & PERMIT	BWJ	ZP

ENGINEER'S SEAL:

CLIENT:

SAULT STE. MARIE

CITY OF SAULT STE. MARIE

DOWNTOWN CIVIC PLAZA

SAULT STE. MARIE, ON.

CONSULTANT:

TULLOCH ENGINEERING

DRAWING TITLE:

SERVICE BUILDING

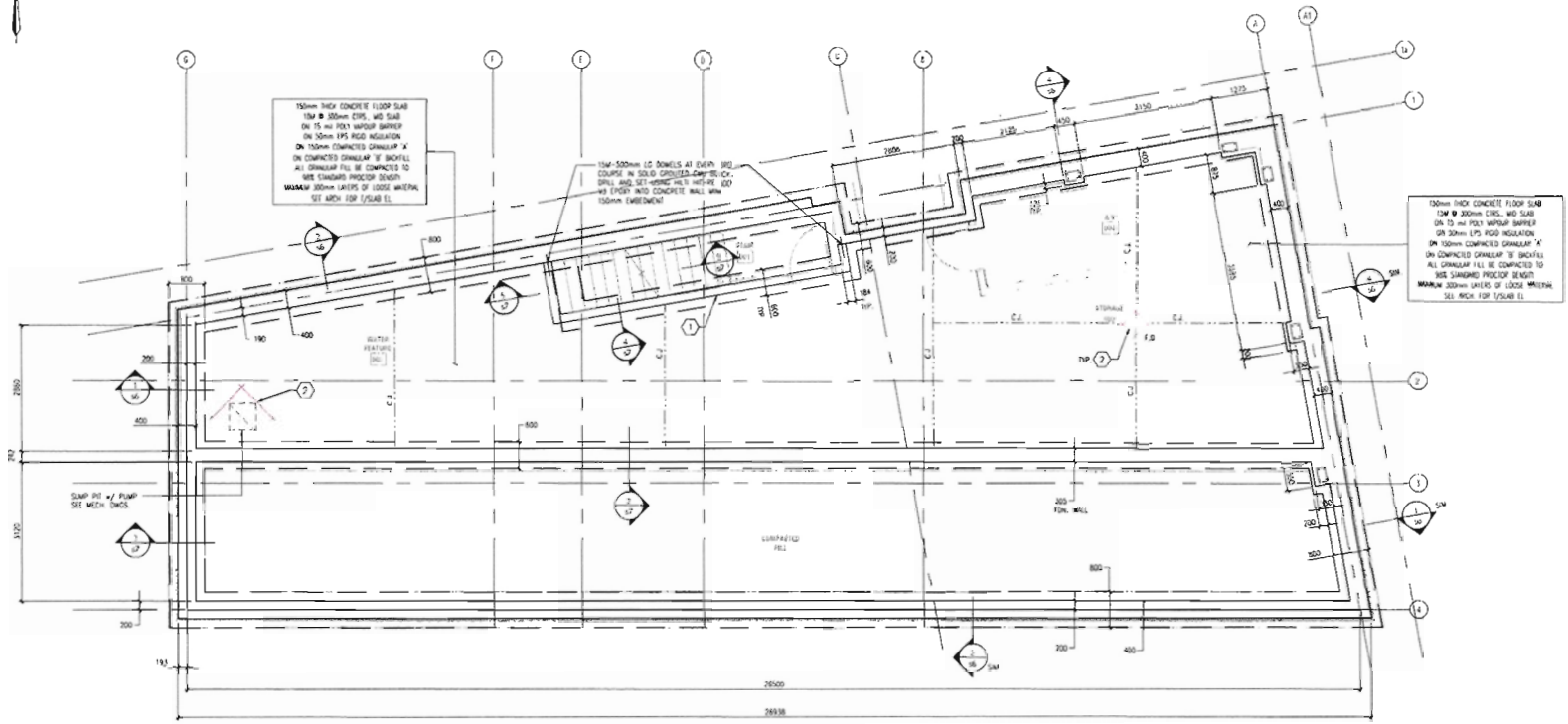
STRUCTURAL

GROUND FLOOR PLAN

DRAWN	DESIGNED	CHECKED	APPROVED
BWJ	ZP	DJM	ZP

SCALE	DATE
As Noted	AUGUST 2021

PROJECT NO.	REVISION	DRAWING
191866	0	S4



LEGEND

C.J. = CONTROL JOINT
SEE DETAIL ON DWG. s7

F.D. = PRE MANUFACTURED FLOOR DRAIN

(1) 200mm REINF. CMU WALL w/ 600mm STRIP FOOTING

(2) 15M DIAGONAL BARS - 1200 Lg. AT FLOOR DEPRESSIONS AND OPENINGS IN SLAB

FOUNDATION PLAN
SCALE: 1:50

ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2022

KEY PLAN

DATE	REV.	REVISION	BY	APP'D
22 02 25	0	ISSUED FOR TENDER & PERMIT	DMJ	ZP

ENGINEER'S SEAL

CLIENT
SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

CONSULTANT:
TULLOCH ENGINEERING

DRAWING TITLE
SERVICE BUILDING
STRUCTURAL
FOUNDATION PLAN

DRAWN	DESIGNED	CHECKED	APPROVED
BWJ	ZP	DJM	ZP

SCALE	DATE
As Noted	AUGUST 2021

PROJECT No.	REVISION	DRAWING
191866	0	s3

CONCRETE

1. CONCRETE IS SPECIFIED USING ALTERNATIVE NUMBER OF CSA A23.1 TABLE 2 AS FOLLOWS

PARAMETER	INTERIOR SLAB AND TOPPINGS	EXTERIOR SLAB	INTERIOR FDN. WALLS	EXTERIOR FOUNDATIONS (EXT. WALLS AND FTGS.)
EXPOSED CLASS (TABLE 1)	N	C2	N	F-2
AIR CONTENT CATEGORY (TABLE 4)	N/A	1	N/A	1
MAX. W/C RATIO (TABLE 2)	AS PER MIX DESIGN	0.45	AS PER MIX DESIGN	AS PER MIX DESIGN
CURING TYPE (TABLE 2)	3	2	1	2
MIN. COMPRESSIVE STRENGTH @ 28 DAYS	25 MPa	32 MPa	30 MPa	30 MPa

2. AT LEAST TWO (2) WEEKS PRIOR TO THE PLACEMENT OF CONCRETE THE CONTRACTOR SHALL SUBMIT THE FOLLOWING TO THE ENGINEER FOR REVIEW:
   - A VALID CERTIFICATE OF READY MIXED CONCRETE PRODUCTION FACILITIES OR A VALID 'CERTIFICATE OF MOBILE MIX CONCRETE PRODUCTION FACILITIES' AS ISSUED BY THE 'READY MIXED CONCRETE ASSOCIATION OF ONTARIO' TO THE PLANT BEING USED.
   - A COMPLETED 'CONCRETE MIXED DESIGN SUBMISSION FORM'
   - A QUALITY PLAN THAT DESIGNATES A SPECIFIED SLUMP OR SOME OTHER MEASURE OF WORKMANSHIP
   - TEST RESULTS TO SHOW COMPLIANCE WITH CSA A23.1
   - AIR VOID SYSTEM OF HARDENED CONCRETE
   - STATISTICAL STRENGTH TEST ANALYSIS TO CONFIRM THE STRENGTH LEVEL FOR EACH CLASS OF CONCRETE INCLUDING THE EXPECTED 7/28 DAY STRENGTH RATIO
3. FABRICATION AND PLACEMENT OF REINFORCING STEEL TO BE IN ACCORDANCE WITH CSA A23.1 AND THE REINFORCING STEEL INSTITUTE OF CANADA'S "REINFORCING STEEL MANUAL OF STANDARD PRACTICE"
4. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO CSA G30.18 M92, Fy=400 MPa (GRADE 400)
5. AIR ENTRAINMENT ADMIXTURE TO CSA STANDARD A266.1
6. CHEMICAL ADMIXTURES TO CSA STANDARD A2662
7. CONCRETE SHALL NOT BE POURED UNTIL REBAR HAS BEEN INSPECTED BY THE ENGINEER.
8. WHERE REBARS JOIN AT CORNERS PROVIDE CORNER BARS FOR LAPS.
9. CONCRETE COVER FOR REINFORCING STEEL AS PER TABLE 17 OF CSA A23.1:
   - ALL CONCRETE CAST AGAINST EARTH 3"
   - ALL CONCRETE CAST IN FORMS BUT EXPOSED TO EARTH OR WEATHER 2"
   - BARS 20M AND SMALLER IN WALLS AND SLABS 1 1/4"
   - CONCRETE NOT EXPOSED TO EARTH AND WEATHER 1" OR 1.5 NOMINAL BAR DIAMETER
10. ALL REINFORCING BARS SHALL BE ACCURATELY PLACED AND ADEQUATELY SUPPORTED BY PRECAST CONCRETE, ADDITIONAL BARS, STIRRUPS, TIES OR APPROVED CHAIRS AGAINST DISPLACEMENT
11. CONTINUOUS AND TEMPERATURE REINFORCING BARS SPLICES TO BE LAPPED 40 BAR DIAMETERS OR A MINIMUM OF 12" AT SPLICES AND CORNERS, UNLESS OTHERWISE SHOWN ON SECTION OR TYPICAL DETAILS. LAP CONTINUOUS TOP BARS AT CENTRE BETWEEN SUPPORTS AND CONTINUOUS BOTTOM BARS AT SUPPORTS AS REQUIRED, TERMINATE CONTINUOUS BARS AT NON CONTINUOUS ENDS WITH STANDARD HOOKS
12. PROVIDE DOWELS FROM FOOTING AND/OR CAPS TO CONCRETE WALLS, PIERS, AND COLUMNS SIMILAR IN NUMBER, SIZE AND SPACING TO THE VERTICAL STEEL IN WALLS, PIERS AND COLUMNS UNLESS NOTED OTHERWISE.
13. CONSTRUCTION JOINTS: SLAB CONSTRUCTION JOINTS MAY BE MADE ONLY AT APPROVED LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ARCHITECT OR ENGINEER.
14. ALL CONCRETE FOR EXTERIOR SLABS AND FOUNDATION WALLS SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 1/4" (19MM) WITH A 4-7% AIR ENTRAINMENT.
15. USE VIBRATORS FOR PLACEMENT OF CONCRETE 20 MM IN DIAMETER IN THE SLAB.
16. FOR READY-MIX CONCRETE THE MAXIMUM TIME PERMITTED BETWEEN CHARGING THE MIXER AND FINAL DEPOSIT IS 90 MINUTES. THERE IS NO TOLERANCE FOR ADDITIONAL TIME SPANS UNLESS PRIOR APPROVAL IS GIVEN BY ENGINEER.
17. USE PLASTIC OR CONCRETE BAR SUPPORTS IN EXPOSED LOCATIONS
18. EXPOSED CONCRETE SHALL BE FREE FROM HONEYCOMBING, VOIDS, LOSS OF FINES, VISIBLE FLOW LINES AND COLD JOINTS, CHIPS, AND SPALLS. EXPOSED CONCRETE SHALL BE RUBBED SMOOTH USING WATER AND CARBORUNDUM BRICK. PATCH DEFECTS AND TIE HOLES. REMOVE FINS.
19. PROTECT FRESH CONCRETE FROM PREMATURE DRYING, SUNSHINE, EXCESSIVELY HOT OR COLD TEMPERATURES AND MECHANICAL INJURY. MAINTAIN AT A RELATIVELY CONSTANT TEMPERATURE FOR AS LONG AS REQUIRED FOR HYDRATION OF THE CEMENT AND CURING OF THE CONCRETE.
20. APPLY CURING/SEALING COMPOUND OR FLOOR SURFACE HARDENER AS PER MANUFACTURERS INSTRUCTIONS.
21. SEE SCHEDULE FOR SPLICE LENGTHS IN CONTINUOUS REBAR LENGTHS.
22. WHERE REBARS JOIN AT EXTERIOR CORNERS PROVIDE 2'X2' (600MMX600MM) CORNER BARS OR 2' (610MM) BEND FOR BAR LAPS.

BAR SIZE	MINIMUM LAP LENGTH
10M	440mm
15M	600mm
20M	770mm
25M	1060mm

EXCAVATION NOTES

1. ALL EXCAVATIONS SHALL BE IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT (FOR WORKPLACE SAFETY)'.
2. EXCAVATIONS TO BE EXTENDED TO THE DEPTHS INDICATED.
3. ALL EXCAVATIONS SHALL BE SHEETED, DITCHED, OR WATERED AS REQUIRED TO PLACE THE CONCRETE FOR THE FOUNDATIONS IN THE DRY.
4. CONCRETE FOR FOOTINGS SHALL NOT BE PLACED ON OR AGAINST SOIL WHICH IS FROZEN.
5. ALL UNDISTURBED WATER SOIL SHALL BE PROOF ROLLED PRIOR TO PLACEMENT OF ANY NEW FOOTINGS.

CONCRETE ANCHORS

1. ALL CONCRETE ANCHORS TO BE HILTI KWIK BOLT HOT DIPPED GALVANIZED (DIAMETER AS NOTED ON DRAWINGS).
2. ALL CONCRETE ANCHORS TO BE COMPLETE WITH HOT DIPPED GALVANIZED FLAT WASHERS, NUTS, LOCK NUTS, ETC. AS SPECIFIED ON THE DRAWINGS.
3. ALL EPOXY ADHESIVE SHALL BE HILTI HIT-HY 200/HIT ICE.
4. INSTALL AS PER MANUFACTURER'S SPECIFICATIONS.

MASONRY

1. ALL MASONRY WORK SHALL CONFORM TO NATIONAL BUILDING CODE LATEST EDITION AND CSA STANDARDS S304.1 - 'DESIGN OF MASONRY STRUCTURES', AND CAN3-A371, LATEST EDITION.
2. ALL MASONRY CONNECTORS TO CONFORM TO CSA STANDARD CAN3-A370.
3. MORTAR TO CONFORM TO CAN/CSA-A179M, SHALL BE TYPE 'S' THROUGHOUT WITH 28 DAY COMPRESSIVE STRENGTH OF 1800PSI (12.5MPA) COMPOSITION BY VOLUME: 1/2 PORTLAND + 1 TYPE 'N' CEMENT + 2 1/2 SAND
4. GROUT TO CONFORM TO CSA-A179. USE READY MIXED CONCRETE WITH 3/8" (9MM) COARSE AGGREGATE MAX. OR MIX 1:2:3 CEMENT:SAND:PEA GRAVEL BY VOLUME. PROVIDE 7" (175MM) SLUMP.
5. LOAD-BEARING CONCRETE BLOCK: NORMAL WEIGHT, UNITS TO BE CAN2-A165. USE TYPE H/15/A/M FOR HOLLOW UNITS & TYPE S/15/A/M FOR SOLID UNITS.
6. LOAD-BEARING BRICK: CONFORM TO CSA STANDARD CAN/CSA-A82.1
7. HORIZONTAL JOINT REINFORCING TO BE 9GA GALVANIZED WIRE TRUSS TYPE REINFORCING. USE LADDER TYPE FOR VERTICALLY REINFORCED OR GROUTED WALLS.
8. WHEN REQUESTED, SAMPLING AND TESTING SHALL CONFORM TO CSA STANDARD CAN3-2504
9. LINTELS OVER ALL OPENINGS IN NON LOAD BEARING MASONRY WALLS, UNLESS OTHERWISE SHOWN ON STRUCTURAL DRAWINGS, PROVIDE LINTELS AS PER THE FOLLOWING SCHEDULE

LINTEL SCHEDULE FOR NON LOADBEARING MASONRY WALLS					
THICKNESS OF WALL	MAXIMUM HEIGHT OF SUPPORTED MASONRY = 1200mm (4'-0") SPAN OF OPENING				
	L1 4'-0" OR LESS	L2 4'-0" TO 6'-0"	L3 6'-0" TO 8'-0"	L4 8'-0" TO 10'-0"	TYPE
8"	2L 76x76 x 6.4	2L 100x76 - 6.4	2L 127x76x 6.4 LLV	2L 127x89x9.5 LLV	JJL

10. ALL STEEL LINTELS TO HAVE MINIMUM OF 150mm (6") BEARING OR EACH SIDE OF OPENING
11. 8/8 LINTELS TO BE STITCH WELDED 1@8 50mm @ 450mm CTRS.
12. ALL INTERSECTING BLOCK WALLS TO BE BONDED IN TRUE MASONRY BOND OR WITH 3/16"Ø/2" (5MMX12MM) MASONRY ANCHORS AT 1'-4" (400MM) CTRS VERTICALLY.
13. DAMPEN UNITS BEFORE LAYING TO PREVENT EXCESSIVE SUCTION ON MORTAR.
14. MINIMUM BEAM BEARING PLATE UNLESS NOTED FOR JOIST OR BEAM SUPPLIED BY STEEL FABRICATION
15. SP1 - 150mm CONC BLOCK - 250 x 12 x 125
16. SP2 - 200mm CONC BLOCK - 250 x 12 x 128
17. EACH WITH 2-12mmø ANCHORS.
18. FILL BLOCKS SOLID BELOW BEARING PLATES TWO COURSES AND ALL LINTEL BLOCKS
19. LOAD BEARING & NON-LOAD BEARING WALLS TYPE S MORTAR 12.5 MPa
20. PROVIDE HORIZONTAL REINFORCING AT EVERY 2nd BLOCK COURSE USING HEAVY DUTY BLOCK-LOC LADDER REINFORCING.
21. ALL MASONRY TO BE RUNNING BOND TO DISTRIBUTE LOADS.
22. PROVIDE VERTICAL REINFORCING BESIDE ALL OPENINGS IN WALLS GREATER THAN 3'-6" WIDE CONSISTING OF 15M REBAR IN GROUTED CORE.
23. ENSURE GROUTED CORES ARE 100% FILLED
24. ENSURE THAT VERTICAL REINFORCING IS CONTINUOUS FULL HEIGHT OF WALL
25. USE REBAR POSITIONERS EVERY 2ND COURSE TO HOLD VERTICAL REINFORCING IN CENTRE OF BLOCK CORES (BLOK-LOK REBAR POSITIONERS OR EQUAL)
26. PROVIDE CHASES AND POCKETS IN WALLS FOR STRUCTURAL STEEL BEARING AND INSTALL ALL BEARING PLATES.
27. ALL BLOCKS SUPPORTING CONCENTRATED LOADS TO BE GROUTED SOLID 2 BLOCK COURSES BELOW BEARING OR AS NOTED OTHERWISE.
28. BLOCK IN SOLID AROUND ALL BEAM AND CHANNEL BEARING LOCATIONS IN MASONRY WALLS.
29. ALL STEEL COLUMNS TO BE TIED TO BLOCK WALLS EVERY SECOND COURSE WITH MASONRY TIES AS FOLLOWS.
30. BLOCK-LOK BLOK OR EQUAL.
31. WHERE EARTH OR HEAVY WALL CONSTRUCTION IS SPECIFIED, KEEP CAVITY CLEAN AND FREE FROM EXCESSIVE MORTAR DROPPINGS. DO NOT ALLOW WEEP HOLES TO BECOME BLOCKED IN ANY WAY.
32. MAINTAIN A MINIMUM CLEARANCE OF 1/8" (3MM) BENEATH ANY INTERMEDIATE SHELF ANGLES.
33. NO MASONRY WORK SHALL BE PERMITTED WITH TEMPERATURES BELOW 5°C UNLESS PROVISIONS ARE MADE FOR HEATING THE MATERIALS AND PROTECTING THE WORK.

PRECAST HOLLOW CORE CONCRETE SLABS

1. ALL PRECAST UNITS SHALL BE DESIGNED AND CONSTRUCTED IN CONFORMANCE WITH CSA STANDARD CAN3-A23.3
2. LIVE LOAD DEFLECTION SHALL NOT EXCEED L/360 OF THE SPAN
3. PRESTRESSING CABLES SHALL BE UNBONDED 7-WIRE CABLE CONFORMING TO CSA STANDARD CAN3-A23.3.
4. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 6000PSI (41 mPa) AT 28 DAYS.
5. INSTALL 3mm (1/8") KORDLATH BEARING PADS (OR EQUAL), SMOOTH SIDE UP, BELOW SLAB ENDS WHICH BEAR ON CONCRETE OR MASONRY WALLS.
6. ALL PRECAST UNITS TO BE SAMPLED FOR FULL DEAD LOAD PLUS 25% LIVE LOAD TO A MAXIMUM 25mm (1").
7. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS, FOR APPROVAL SHOWING THE PROFESSIONAL ENGINEER'S SEAL OF THE PRECAST SLAB DESIGNER AND THE DESIGN LOAD AS SHOWN ON THESE DRAWINGS
8. GROUT UNITS WITH 1:3 CEMENT:SAND MIX, PROPERLY FILLING SHEAR KEY BETWEEN UNITS.
9. ALL M.E. CONNECTIONS AND INSTALLATION DETAILS ARE TO BE PROVIDED BY MANUFACTURER
10. MARK EACH PRECAST UNIT TO CORRESPOND TO IDENTIFICATION MARK ON SHOP DRAWINGS FOR LOCATION. MARK DATE CAST ON PART OF UNIT WHICH WILL NOT BE EXPOSED.
11. TOP SURFACES TO BE RAKED (ROUGHENED) FOR BONDING OF TOPPING
12. BONDING AGENT: SYNTHETIC LATEX:
    - SIKA® ALBITOL® CONCENTRATE BY SIKA CANADA
    - INTRALOK OR W.R. MEADOWS OF CANADA
    - ACRYL-SET BY CHEMREX (MB/TC)
    - CPD CONCENTRATED LATEX ADHESIVE (OR EQ)
13. CONCRETE TOPPING ON HOLLOW CORE PRECAST CONCRETE FLOORS: BONDED CONCRETE TOPPING ON HOLLOW CORE PRECAST FLOORS TO BE 75MM (3") MIN. SEMI-RIGID UNDERLAYMENT TOPPING SYSTEM USING AQUA-SCREED A OR APPROVED EQUAL. SYSTEM TO INCLUDE MANUFACTURER'S FLOOR PRIMER AND SURFACE SEALER.

MATERIAL TESTING AND INSPECTION

THE CONTRACTOR SHALL COORDINATE WITH CONSULTANT TO ENSURE THAT THE FOLLOWING QUALITY CONTROL ACTIVITIES ARE UNDERTAKEN DURING THE COURSE OF WORK:

1. COMPACTION TESTING AS SPECIFIED ON THE DRAWINGS.
2. REBAR INSPECTION PRIOR TO CONCRETE PLACEMENT.
3. CONCRETE TESTING IN ACCORDANCE WITH CSA A23.1 & A23.2.
4. ALL COST WILL BE PAID THROUGH ALLOWANCE

FINAL CLEAN UP

1. AT THE COMPLETION OF ALL ISSUED FOR CONSTRUCTION ACTIVITIES, THE BUILDING ERECTION CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE ALL WASTE ISSUED FOR CONSTRUCTION MATERIALS, DEBRIS, ETC. FROM THE SITE.
2. AT THE COMPLETION OF ALL ISSUED FOR CONSTRUCTION ACTIVITIES, THE BUILDING ERECTION CONTRACTOR SHALL BE RESPONSIBLE TO SWEEP, WIPE, AND POWER WASH ALL SURFACES ON THE INTERIOR AND EXTERIOR OF THE BUILDING

ABBREVIATIONS

ABV	ABOVE	INT	INTERIOR
ADDTL	ADDITIONAL	LB	LOAD BEARING
AFF	ABOVE FINISHED FLOOR	LG	LONG
ARCH	ARCHITECTURAL	MAT'L	MATERIAL
B.C.	BOTTOM CHORD	MECH	MECHANICAL
BD	BOARD	NTS	NOT TO SCALE
BLL	BOTTOM LOWER LEVEL	OP./OPEN.	OPENING
BUL	BOTTOM UPPER LEVEL	OSB	ORIENTED STRAND BOARD
BP	BASE PLATE	PLYWD	PLYWOOD
BRG	BEARING	PRE-ENG	PRE-ENGINEERED PRODUCT
CJ	CONTROL/CONSTRUCTION JOINT	PT	PRESSURE TREATED
CL	CLEAR	PTS	POINTS
COL	COLUMN	REINF	REINFORCED
CONT	CONTINUOUS	REQ'D	REQUIRED
COV	COVER	SIM	SIMILAR
CTRS	CENTRES	T&G	TONGUE AND GROOVE
C/W	COMPLETE WITH	T	TOP OF
DP	DEEP	T.C.	TOP CHORD
DWGS	DRAWINGS	THK	THICK
ELEV/EL	ELEVATION	TLL	TOP LOWER LEVEL
EL. REF.	REFER TO ELEVATION SHOP DWGS.	TUL	TOP UPPER LEVEL
FD	FLOOR DRAIN	TYP	TYPICAL
FND	FOUNDATION	U/	UNDERSIDE OF
FLR	FLOOR	UOD	UNLESS DIMENSIONED OTHERWISE
FTG	FOOTING	UNO	UNLESS NOTED OTHERWISE
GRAN	GRANULAR	U/NOTED	UNLESS NOTED
HL	HEEL	VERTS	VERTICALS
HORIZ	HORIZONTAL	WWM	WELDED WIRE MESH
HT	HEIGHT	W/	WITH
HVAC	HEATING, VENTILATION, AIR-CONDITIONING	+/-	

KEY PLAN

DATE (D/M/Y)	REV.	REVISION	BY	APP'D
17.01.25	0	ISSUED FOR TENDER & PERMIT	BWJ	ZP

ENGINEER'S SEAL:

CLIENT:

SAULT STE. MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

CONSULTANT:

TULLOCH ENGINEERING

DRAWING TITLE:

SERVICE BUILDING
STRUCTURAL
GENERAL NOTES

BWJ	ZP	DJM	ZP
DRAWN	DESIGNED	CHECKED	APPROVED

As Noted	AUGUST 2021
SCALE	DATE

191866	0	s2
PROJECT NO.	REVISION	DRAWING

TULLOCH ENGINEERING

ISSUED FOR TENDER & PERMIT
FEBRUARY 25 2025

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE ONTARIO BUILDING CODE, LATEST EDITION.
2. CONTRACTOR TO CHECK FOR ALL UNDERGROUND SERVICES LOCATIONS PRIOR TO EXCAVATION AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING SERVICES.
3. STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS. DRAWINGS MUST NOT BE SCALED.
4. BEFORE PROCEEDING WITH WORK, CHECK ALL DIMENSIONS AND REPORT ANY DISCREPANCIES.
5. BEFORE PROCEEDING WITH THE WORK, CHECK ALL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS AGAINST THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND REPORT DISCREPANCIES TO THE CONSULTANT. REFER TO THE ARCHITECTURAL AND OTHER DRAWINGS FOR THE LOCATIONS AND SIZES OF OPENINGS AND SLEEVES NOT SHOWN ON STRUCTURAL DRAWINGS. OBTAIN THE CONSULTANT'S PRIOR APPROVAL BEFORE INSTALLING OPENINGS, SLEEVES, ETC. WHICH ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS.
6. TYPICAL STRUCTURAL DETAILS SHOWN ON THE DRAWINGS SHALL GOVERN THE WORK. IF DETAILS ON OTHER DRAWINGS CONFLICT THE MOST STRINGENT SHALL GOVERN.
7. ALL PRE-MANUFACTURED/FINISHED MATERIALS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS COMPLETE WITH ALL ACCESSORIES, TRIMS, PRIMERS ETC. FOR A COMPLETE JOB.
8. CONTRACTOR ASSUMES ALL RESPONSIBILITY OF DESIGN, ERECTION AND REMOVAL OF TEMPORARY WORKS.
9. FORMWORK SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF CSA A23.1.
10. DESIGN OF FORMWORK IS THE CONTRACTOR'S RESPONSIBILITY.
11. PROVIDE TEMPORARY BRACING, SUPPORTS AND/OR OTHER INSTALLATIONS NECESSARY TO MAINTAIN PLUMBNESS, TRUE ALIGNMENT AND STABILITY OF THE STRUCTURE AND ALL OF ITS PARTS THROUGHOUT ALL ERECTION STAGES.
12. EXCAVATION AND FOUNDATION WORK SHALL CONFORM TO THE LATEST EDITION OF THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
13. SLABS ON GRADE AND ALL STRUCTURAL ELEMENTS FRAMING AND WALL(S) WHICH RETAIN EARTH MUST BE IN PLACE BEFORE BACKFILLING.
14. IT IS THE ULTIMATE RESPONSIBILITY OF THE CONTRACTOR/OWNER TO ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS ARE OBTAINED & POSTED PRIOR TO PROCEEDING WITH CONSTRUCTION. THESE PERMITS/APPROVALS MAY INCLUDE (BUT ARE NOT NECESSARILY LIMITED TO):
    i) MUNICIPAL BUILDING DEPARTMENT PERMIT TO CONSTRUCT (MULTIPLE PERMITS MAY BE REQUIRED)
    ii) REGIONAL CONSERVATION AUTHORITY APPROVAL
    iii) ELECTRICAL SAFETY AUTHORITY (ESA) PERMIT
15. GENERAL CONTRACTOR AND SUBCONTRACTORS SHALL USE ALL MEANS NECESSARY TO PROTECT MATERIALS BEFORE, DURING AND AFTER INSTALLATION AND TO PROTECT INSTALLED WORK AND MATERIALS OF ALL TRADES.
16. IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE CONSULTANT AND AT NO ADDITIONAL COST TO THE OWNER.
17. PRIOR TO INSTALLATION OF SUBSEQUENT WORK, CAREFULLY INSPECT THE INSTALLED WORK OF ALL OTHER TRADES AND VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THE SUBSEQUENT WORK MAY PROPERLY COMMENCE. DO NOT EXECUTE ANY ADDITIONAL WORK UNTIL ALL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

DESIGN LOADINGS

1. THE STRUCTURE DESCRIBED ON THE STRUCTURAL DRAWINGS HAS BEEN DESIGNED TO COMPLY WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE 2012.
2. THE APPLICABLE CLIMATIC DATA USED FOR THIS BUILDING LOCATED IN SAULT STE. MARIE, ONTARIO ARE AS FOLLOWS:
    - GROUND SNOW LOAD (1 in 50 PROBABILITY OF EXCEEDENCE) — Ss = 3.1 kPa
    - ASSOCIATED RAIN LOAD — Sr = 0.4 kPa
    - IMPORTANCE FACTOR FOR WIND LOAD — Iw = 1.0
    - IMPORTANCE FACTOR FOR SNOW LOAD — Is = 1.0
    - BASIC ROOF SNOW LOAD FACTOR — Cb = 0.8
    - SEISMIC DATA — Sa (0.2) = 0.095
    - HOURLY WIND PRESSURE 1/50 — q = 0.44 kPa
3. REMARKS: FACTORS BASED UPON NBC 2010 STRUCTURAL COMMENTARIES TO PART 4.

FOUNDATION

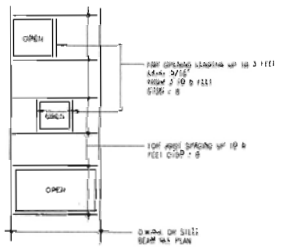
1. REMOVE, OFF SITE, ALL TOPSOIL AND ORGANIC MATERIAL FROM BUILDING AREA.
2. BACKFILL AS NECESSARY IN MAXIMUM LIFTS OF 15" (200MM) OF LOOSE MATERIAL COMPACTED TO A STANDARD PROCTOR DENSITY OF 100% AND SHALL BE VERIFIED BY COMPACTION TESTS.
3. SHOULD UNUSUALLY SOFT SOILS BE ENCOUNTERED DURING EXCAVATION, NOTIFY ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION.
4. PROTECT ALL FOOTINGS, WALLS, SLABS ON GRADE AND ADJACENT SOIL AGAINST FROST ACTION AND FREEZING AT ALL TIMES DURING CONSTRUCTION.
5. ALL EXTERIOR FOOTINGS AND INTERIOR FOOTINGS SUBJECT TO HEATING WHEN CONSTRUCTION IS COMPLETED SHALL BE FOUNDED AT STRATA SAFELY SUPPORTING THE DESIGN BEARING PRESSURE BUT NO LESS THAN 5' (1500MM) BELOW FINISHED GRADE.
6. THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS, FOR FOOTINGS OR ALONG STEPPED FOOTINGS OR TRENCHES SHALL NOT EXCEED A RISE OF 7" (175MM) IN A RUN OF 10" (250MM) MAXIMUM STEP TO BE 24" (600MM).
7. KEEP EXCAVATIONS CONTINUOUSLY DRY BEFORE CONCRETE IS PLACED. REMOVE ANY LOOSE MATERIAL OR SOIL SOFTENED BY WATER PRIOR TO PLACING CONCRETE.
8. DO NOT BACKFILL AGAINST WALLS RETAINING EARTH UNTIL ELEMENTS PROVIDING LATERAL SUPPORT ARE COMPLETE. PLACE BACKFILL SIMULTANEOUSLY ON BOTH SIDES OF WALLS BELOW GRADE.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO CAN/CSA-S19.
2. STRUCTURAL STEEL SHALL BE NEW G40.21 350W MATERIAL UNLESS NOTED OTHERWISE.
3. HOLLOW STRUCTURAL SECTIONS SHALL BE ASTM A500 GRADE C OF G40.21 350W MATERIAL UNLESS NOTED OTHERWISE.
4. ANGLES CHANNELS AND PLATES TO BE G40-21-300W MATERIAL UNLESS NOTED OTHERWISE.
5. WELDING TO CSA W59 WELDED STEEL CONSTRUCTION, LATEST EDITION.
6. FABRICATOR SHALL BE CERTIFIED ACCORDING TO CSA STANDARD W47.1 DIVISION 1 OR 2, LATEST EDITION.
7. ALL BOLTED CONNECTIONS TO BE BEARING TYPE. THE BOLTS SHALL BE SPECIFIED TO BE A SNUG TIGHT CONDITION AS DEFINED BY CAN/CSA S16.1.
8. STRUCTURAL STEEL ERECTOR SHALL BE RESPONSIBLE FOR PROVIDING AND ERECTING OF TEMPORARY GUYING AND BRACING NECESSARY FOR THE SAFE ERECTION OF THE STRUCTURE. MAINTAIN TEMPORARY BRACING UNTIL COMPLETION OF THE ENTIRE STRUCTURE INCLUDING ROOF DECKS AND OTHER ELEMENTS WHICH ARE PART OF THE LATERAL LOAD RESISTING SYSTEM.
9. MEMBERS SHALL BE CONNECTED FOR THE FORCES INDICATED. WHERE THESE FORCES ARE NOT SHOWN, COMPRESSION AND TENSION SHALL BE CONNECTED FOR 50% OF THE EFFECTIVE STRENGTH OF THAT MEMBER AND BEAMS CONNECTED FOR THE FULL UNIFORM CAPACITY FOR THAT SPAN.
10. WHERE MOMENT CONNECTIONS ARE CALLED FOR BUT VALUES ARE NOT INDICATED, DESIGN CONNECTIONS FOR FULL MOMENT CAPACITY OF THE SMALLER MEMBER JOINED.
11. SPLICES SHALL BE DESIGNED TO DEVELOP THE FULL CAPACITY OF THAT MEMBER AT THE POINT OF SPLICE. MEMBERS SHALL NOT BE SPLICED AT THE MAXIMUM STRESS POINTS. NO SPLICE IS TO BE MADE UNLESS SHOWN ON THE DRAWINGS OR REVIEWED AND APPROVED BY THE CONSULTANT.
12. PROVIDE WELDED STIFFENERS PLATES ON BOTH SIDES OF BEAMS AT POINTS OF CONCENTRATED LOADS INCLUDING BEAMS SUPPORTING COLUMNS OR RUNNING OVER THE TOP OF COLUMNS.
13. ALL BEAMS CANTILEVERED SHALL HAVE A MIN. OF 2-10mm (3/8") STIFFENERS EACH SIDE OF WEB U.N.O.
14. STEEL CONTRACTOR TO BE RESPONSIBLE TO PROVIDE ALL LOOSE STEEL ITEMS (LINTELS, BEARING PLATES, WALL PLATES ETC.)
15. SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW BEFORE PROCEEDING WITH FABRICATION. DRAWINGS OF COMPONENTS AND CONNECTIONS DESIGNED BY THE FABRICATOR SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
16. ANCHOR BOLTS TO ASTM A307, UNLESS NOTED OTHERWISE.
17. STRUCTURAL BOLTS, NUTS AND WASHERS - TO ASTM A325.
18. GROUT (NON-SHRINK) UNDER BEARING PLATES SHALL BE M-BED BY SIKA CORP. OR APPROVED EQUAL.
19. NO DRILLING OR CUTTING AFTER FABRICATION OF STRUCTURAL STEEL UNLESS APPROVED BY THE ENGINEER / ARCHITECT.
20. ALL FIELD WELDED CONNECTIONS TO BE INSPECTED BY FABRICATION CONTRACTOR.
21. PROVIDE WEEP HOLES IN ALL HSS STRUCTURAL.

TYPICAL DETAILS FOR FRAMING OF OPENINGS THROUGH ROOF AND WOOD PLANK DECKING

1. TOP OF FRAMING STEEL AT U/S OF PLANK DECKING UNLESS OTHERWISE NOTED.
2. LOCATION OF ALL MECHANICAL UNITS AND OPENINGS THROUGH ROOF IS BASED ON INFORMATION SUPPLIED BY MECHANICAL DRAWINGS. THE STRUCTURAL STEEL SUBCONTRACTOR MUST CONFIRM ALL THESE LOCATIONS AND SIZES WITH THE MECHANICAL CONTRACTOR. O.H.S.J. MUST BE DESIGNED FOR ADDITIONAL LOADS FROM MECHANICAL UNITS. IF LOCATIONS OR DETAILS VARY FROM THOSE SHOWN. THE STRUCTURAL ENGINEER MUST BE INFORMED AND INSTRUCTIONS RECEIVED BEFORE PROCEEDING WITH THE WORK.
3. THE STRUCTURAL STEEL SUBCONTRACTOR TO SUBMIT ERECTION DRAWINGS TO THE MECHANICAL ENGINEER AND FOR CONTRACTOR FOR APPROVAL OF SIZE AND LOCATION OF OPENINGS FOR MECHANICAL UNITS.



ROOF DECK NOTES

1. 64mm x 152mm (NO) WOOD PLANK DECKING SHALL BE INSTALLED AS ROOF DECK IMPLEMENTED AT 45 DEGREES ANGLE TO THE ROOF JOISTS.
2. WOOD PLANK DECKING SHALL BE No2 DOUGLAS FIR COMMERCIAL GRADE.
3. 1/4" x 3 1/2" WITEX SCREWS W205-CAT SHALL BE USED TO INSTALL DECKING TO OWSJ. A SCREW AT EACH SPACER IN 60mm SHALL BE DRIVEN FROM U/S OF DECK AT EACH PLANK. FOLLOW MANUFACTURER'S INSTALLATION PROCEDURE/SPECIFICATION.
4. CONCENTRATED LOADS ARE NOT TO BE HUNG FROM DECK SPAN INCLUDING SUSPENDED CEILING HANGERS.

OPEN WEB STEEL JOISTS

1. SUBMIT SHOP DRAWING IN CONFORMANCE WITH THE SPECIFICATIONS FOR APPROVAL BEARING THE PROFESSIONAL ENGINEER'S SEAL OF THE OWSJ DESIGNER AND THE DESIGN LOADS AS SHOWN THESE DRAWINGS.
2. OWSJ SHALL TO BE WELDED TO THE BEARING PLATE WITH MM x 76MM (3/16" x 3") FILLET WELD BOTH SIDES.
3. SHOES OF OPEN WEB STEEL JOISTS SHALL BE 100MM (4") HIGH UNLESS NOTED OTHERWISE.
4. ALL JOISTS TO BEAR ON CENTRE OF MASONRY AND STEEL BEARING UNIT UNLESS NOTED OR SHOWN OTHERWISE.
5. JOIST DEFLECTION UNDER SERVICE LOADS TO BE LIMITED TO L/360 UNLESS NOTED OTHERWISE.

COATINGS

1. ALL STRUCTURAL STEEL SHALL RECEIVE ONE COAT OF CP-40 SHOP PRIMER PAINT EXCEPT FOR SURFACES TO BE WELDED, SURFACES IN CONTACT WITH CONCRETE AND FAYING SURFACES IN FRICTION TYPE BOLTED JOINTS. TOUCH UP SHOP COAT IN FIELD INCLUDING WELD HEADS AND FIELD WELDS AFTER HAVING SLAG REMOVED TOP COAT AS PER SPECIFICATIONS.
2. EXTERIOR OR PERMANENTLY EXPOSED STEEL TO RECEIVE 2 COATS OF EPOXY PAINT.
   PRIME - 1 COAT OF AMERCOAT 68HS @ 2.0 TO 3.0 MILS D.F.T., FINISH - 1 COAT OF AMERLOCK 2/450 @ 4.0 TO 6.0 MILS D.F.T.

FASTENERS / BOLT SETS

1. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE WASHERS, HEX NUTS, ETC., OF SIMILAR MATERIAL AS THE SPECIFIED BOLT/ANCHOR BOLT/THREADED ROD FOR ALL NOTED CONNECTIONS.
2. ALL FASTENERS AND BOLTS SETS TO BE STRUCTURAL GRADE A325.

LIGHTWEIGHT STEEL FRAMING

1. DESIGN, FABRICATION AND CONSTRUCTION OF COLD FORMED STEEL STRUCTURAL FRAMING SHALL CONFORM TO CSA STANDARD CAN/CSA-S136-M OR LATEST EDITION. DESIGN AND CONNECTIONS FOR THE APPLIED WIND SHEAR.
2. STEEL PROPERTIES SHALL MEET CSA S136-M AND ASTM A446. COATINGS SHALL BE ZINC MIN. (Z275 (G90)).
3. STEEL GRADES SHALL BE:
4. GRADE A: 33KSI (228 MPA) MINIMUM YIELD FOR 0.060" MATERIAL AND THINNER.
5. GRADE D: 50KSI (345 MPA) MINIMUM YIELD FOR 0.060" MATERIAL AND THINNER.
6. WIND LOADS AND DESIGN SHALL CONFORM TO THE LATEST ONTARIO BUILDING CODE, MAX DEFLECTION L/360.
7. SUBMIT NAME OF THE MANUFACTURER OF STEEL STUDS. SUBMIT TABLES OF PHYSICAL AND STRUCTURAL PROPERTIES FOR MEMBERS TO BE USED.
8. SHOP DRAWINGS, ERECTION DRAWINGS AND DESIGN DRAWINGS BEARING THE SEAL OF A QUALIFIED PROFESSIONAL ENGINEER, WHERE APPLICABLE, SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
9. BRIDGING SHALL BE PROVIDED AT 4'-0" O.C.
10. UTILIZE DEFLECTION STUD SLIPS FOR ALL HEIGHT STUDS AND ROD CONNECTORS TO CONNECT STUDS OVER OPENINGS.
11. TYPICAL FASTENER SCHEDULE UNLESS NOTED
12. (GAGE 12 STUD: #10-16 SMS EACH FLANGE
13. (GAGE 10 STEEL: HILTI METAL HIT ANCHOR @ 600 (24") C/C
14. (GAGE 12 TRACK: #10-16 SMS AT 600 (24") C/C

KEY PLAN

DATE	REV.	REVISION	BY	APP'D
21.07.15	0	ISSUED FOR TENDER & PERMIT	DJM	ZP

ENGINEER'S SEAL:

CLIENT:
SAULT STE.MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.

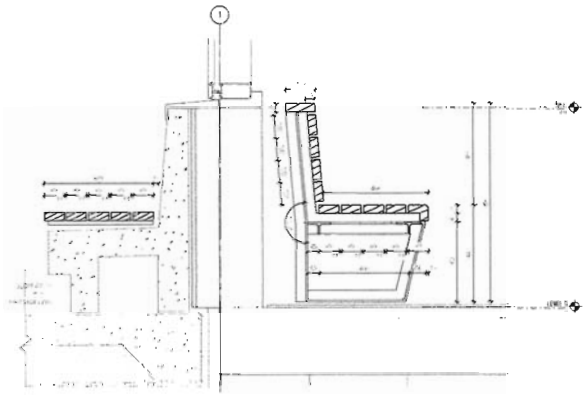
CONSULTANT:
TULLOCH ENGINEERING

DRAWING TITLE:
SERVICE BUILDING
STRUCTURAL
GENERAL NOTES

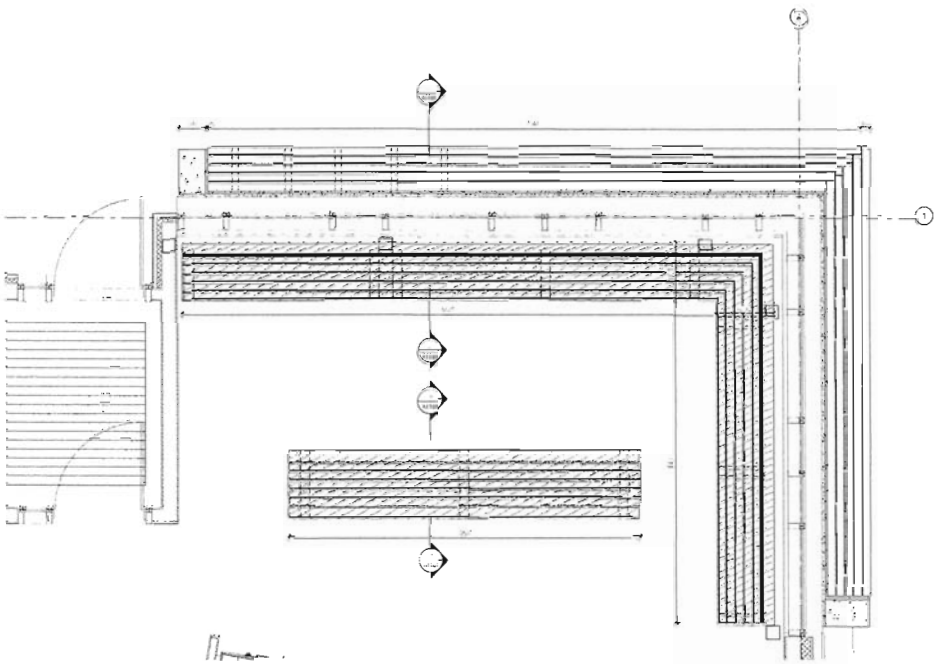
BWJ	ZP	DJM	ZP
DRAWN	DESIGNED	CHECKED	APPROVED
As Noted		AUGUST 2021	
SCALE		DATE	

191866	0	S1
PROJECT No.	REVISION	DRAWING No.

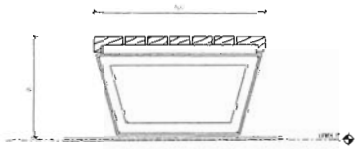
TULLOCH ENGINEERING
ISSUED FOR TENDER & PERMIT
FEBRUARY 26 2021



2 SECTION THROUGH BENCH AT WALL



3 MILLWORK PLAN



3 SECTION THROUGH FREESTANDING BENCH

NOTES

No.	Date	Issued For
5	2021-06-25	Tender / Permit
4	2021-06-10	Issued for Consultant Coordination

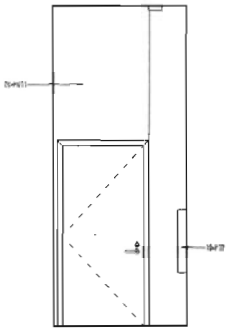
SSM DOWNTOWN CORE
PLAZA - SERVICE
BUILDING

Queen Street South, Site 1B1
Mono, ON

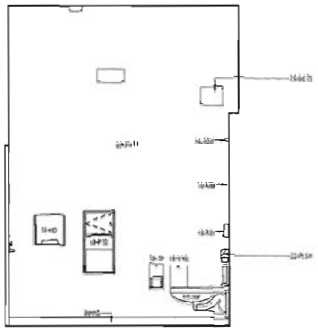
BrookMcIlroy

SHEET TITLE
MILLWORK

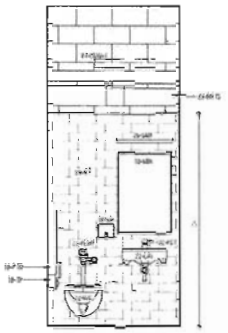
PROJECT NO. 19-076
DATE 2021-06-10
SHEET NO. A1101



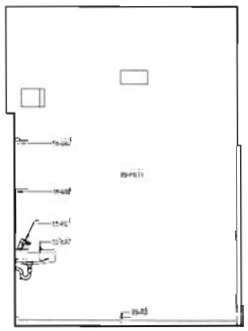
1 TYP WASHROOM NORTH



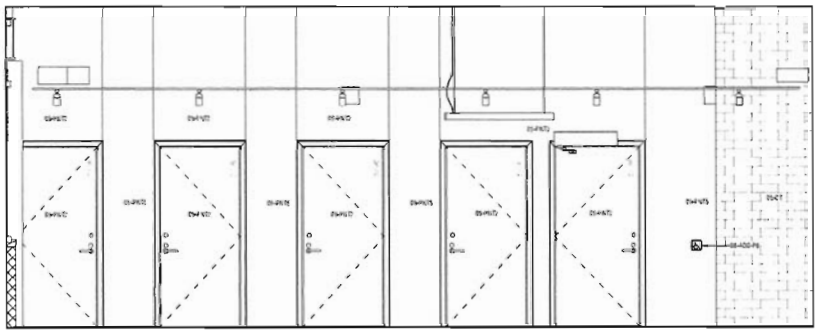
2 TYP WASHROOM EAST



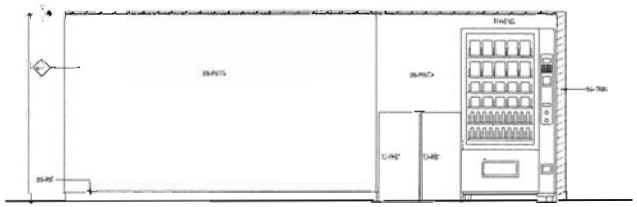
3 TYP WASHROOM SOUTH



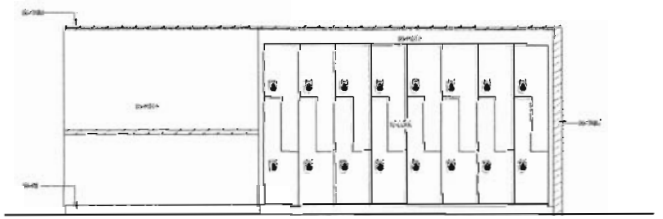
4 TYP WASHROOM WEST



5 WASHROOMS EXTERIOR WALL



6 FREESTANDING LOCKER SCREEN WALL



7 LOCKERS WALL - SKATE CHANGE SHOP

NOTES:

No.	Date	Issued For
5	2021-02-26	Tender / Permit
4	2021-02-05	Consultant Coordination
3	2020-10-09	Issued for Cost Estimate
2	2020-09-04	Issued for Consultant Coordination
1	2020-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS

SSE DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 1Y3

BrookMcIlroy

SHEET TITLE

INTERIORS

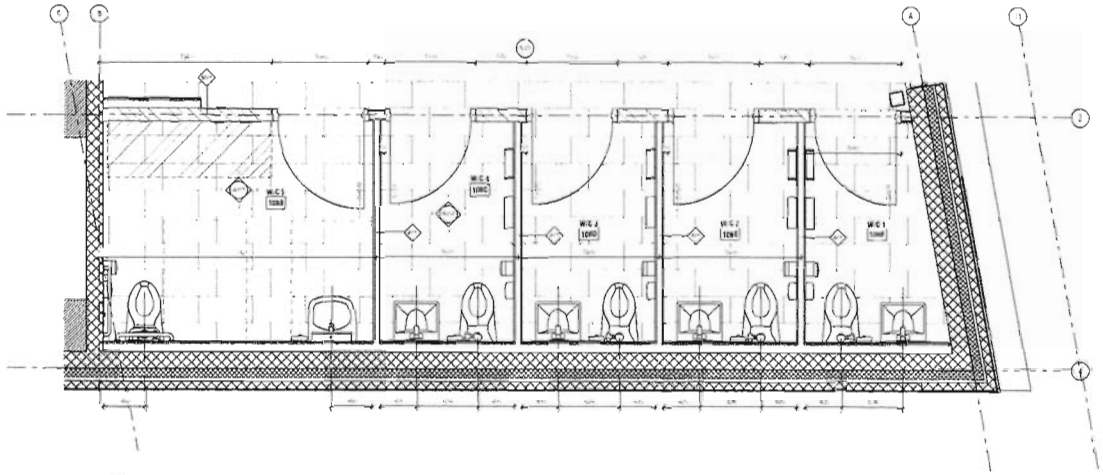
PROJECT NO. 19-076

DATE 2021-05-10

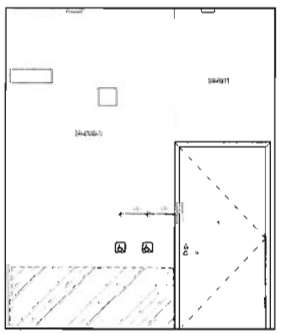
SHEET NO.

A902

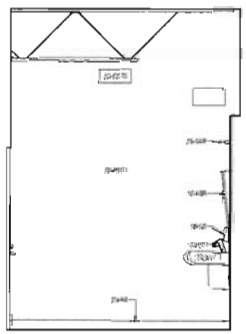
NOTES:



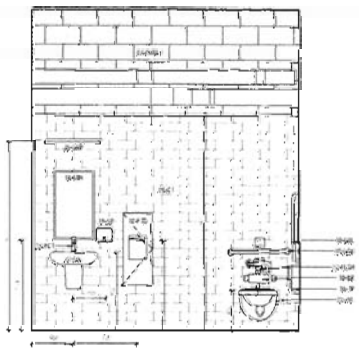
1 ENLARGED WASHROOM LAYOUT



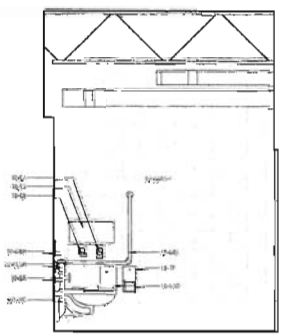
2 UNIVERSAL WASHROOM NORTH



3 UNIVERSAL WASHROOM EAST



4 UNIVERSAL WASHROOM SOUTH



5 UNIVERSAL WASHROOM WEST

No.	Date	Issued For
4	2022-02-25	Vendor / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
COLIN BROOK
LICENCE
5415

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

BrookMcIlroy

INTERIORS

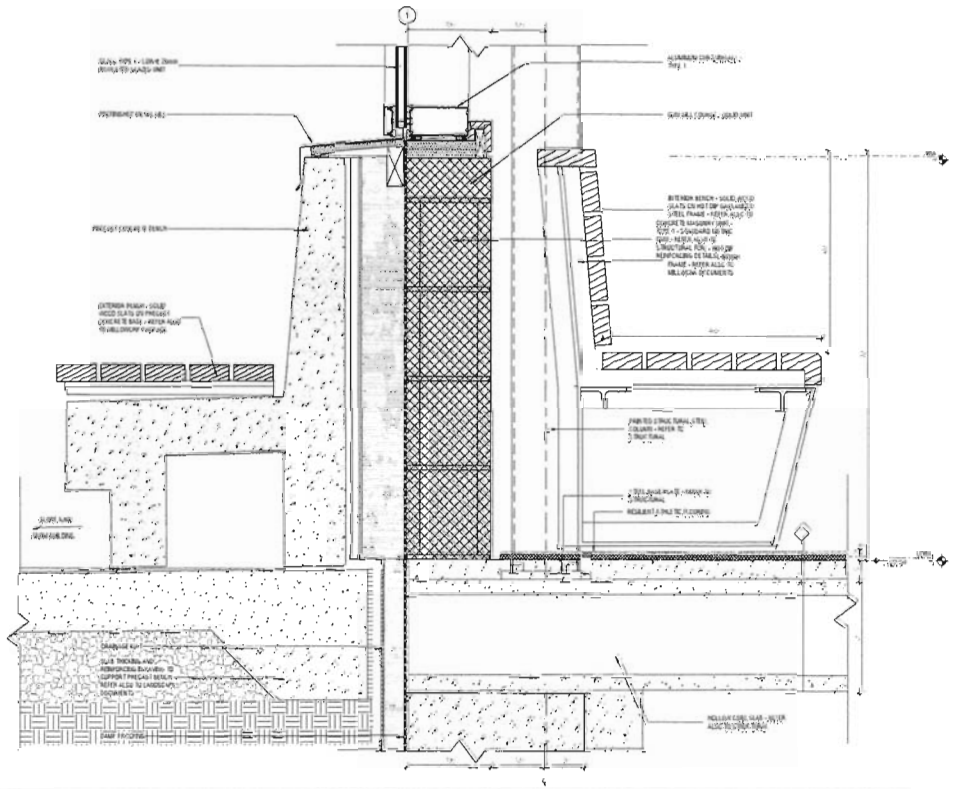
PROJECT NO 19-076

DATE 2021-06-10

SHEET NO

A901

NOTES:



2 BENCH DETAIL

No.	Date	Issued For
5	2021-06-10	Permit
4	2021-04-07	Consultant Coordination
3	2021-03-04	Issued for Cost Estimate
2	2021-02-12	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street/North Court Rd.
Stouffville, ON L4A 2Z9

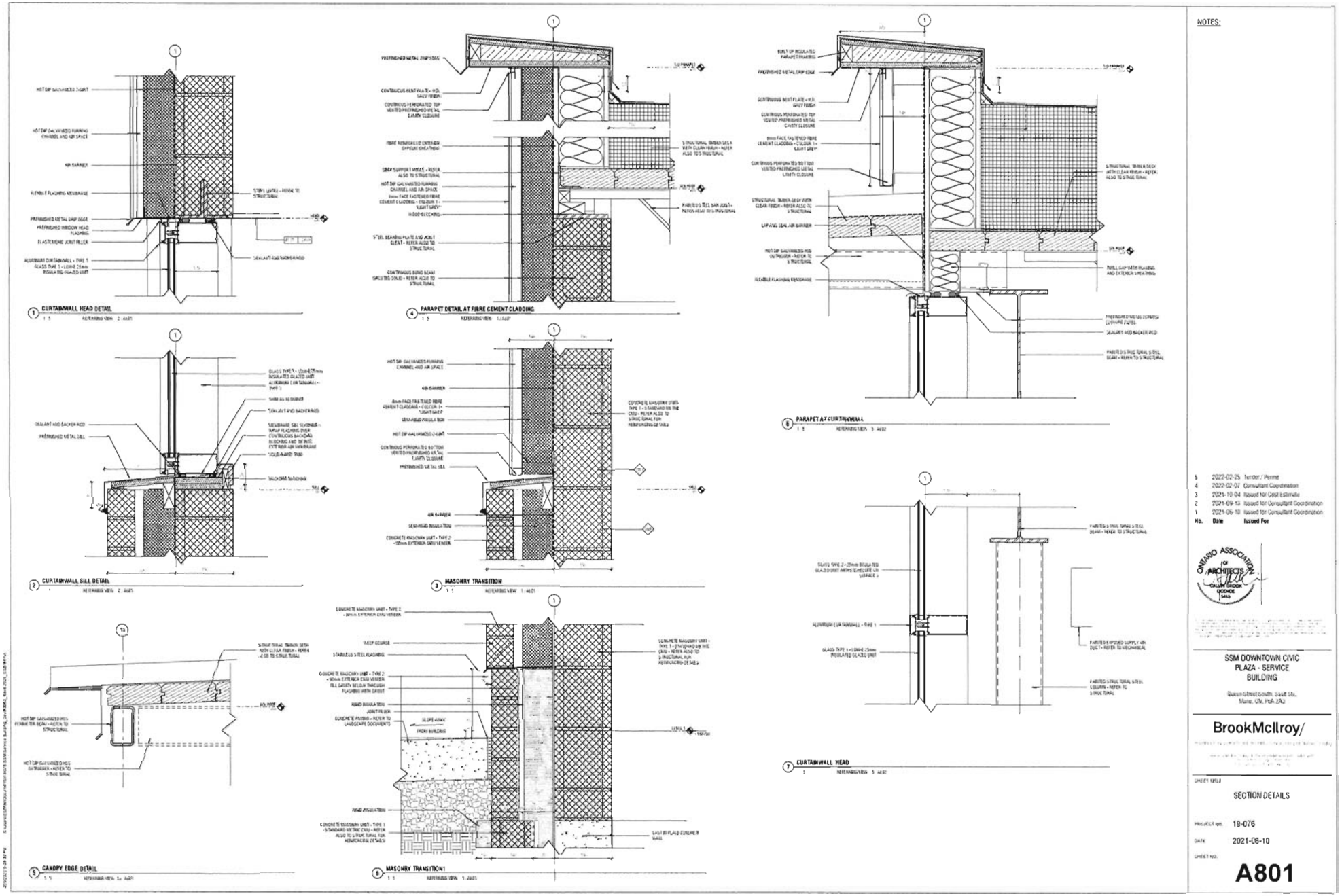
BrookMcIlroy

SECTION DETAILS

PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO. A802



NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CHLOE BROOK
LICENCE 5413

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A2

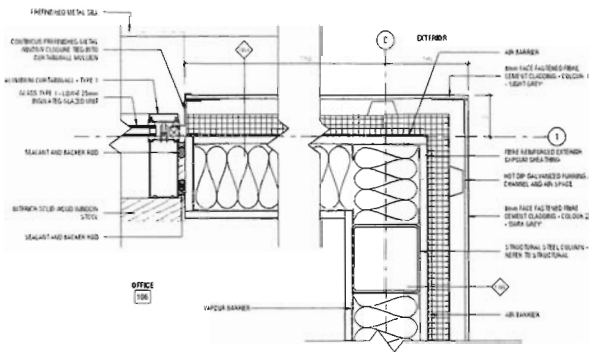
BrookMcIlroy/

SHEET TITLE
SECTION/DETAILS

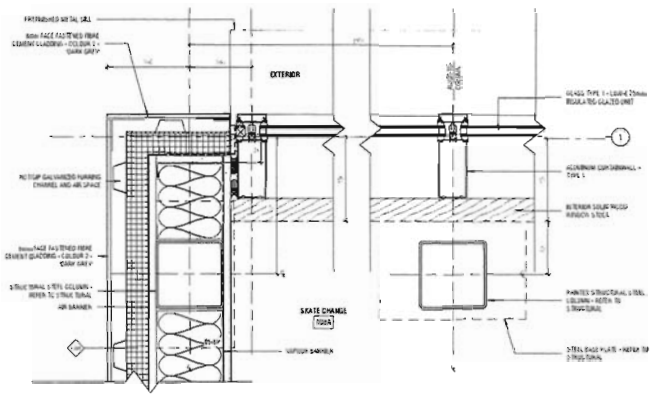
PROJECT no. 19-076

DATE 2021-06-10

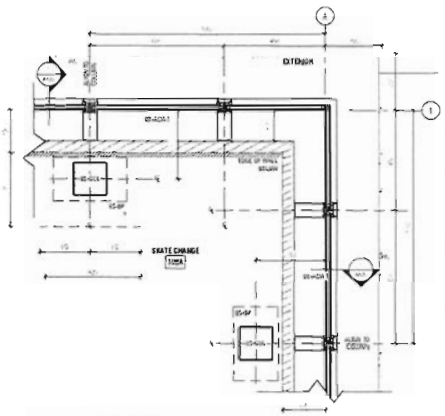
SHEET NO.
A801



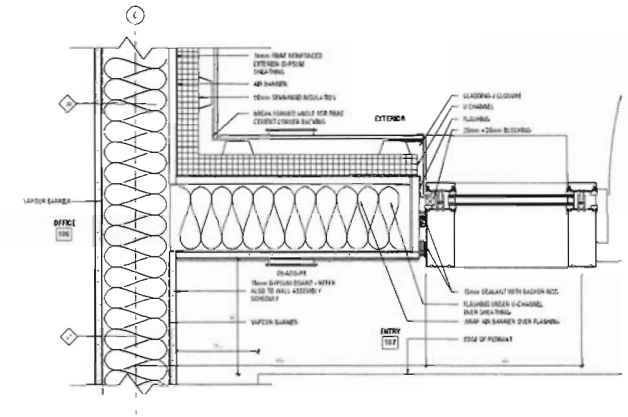
1 DETAIL AT ENTRANCE DOOR OPERATOR1



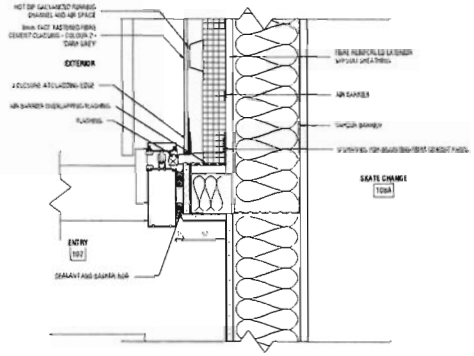
2 DETAIL AT EDGE OF CURTAINWALL



3 CURTAINWALL DETAIL AT CORNER



4 DETAIL AT ENTRANCE DOOR OPERATOR



5 DETAIL AT ENTRANCE DOOR

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2X5

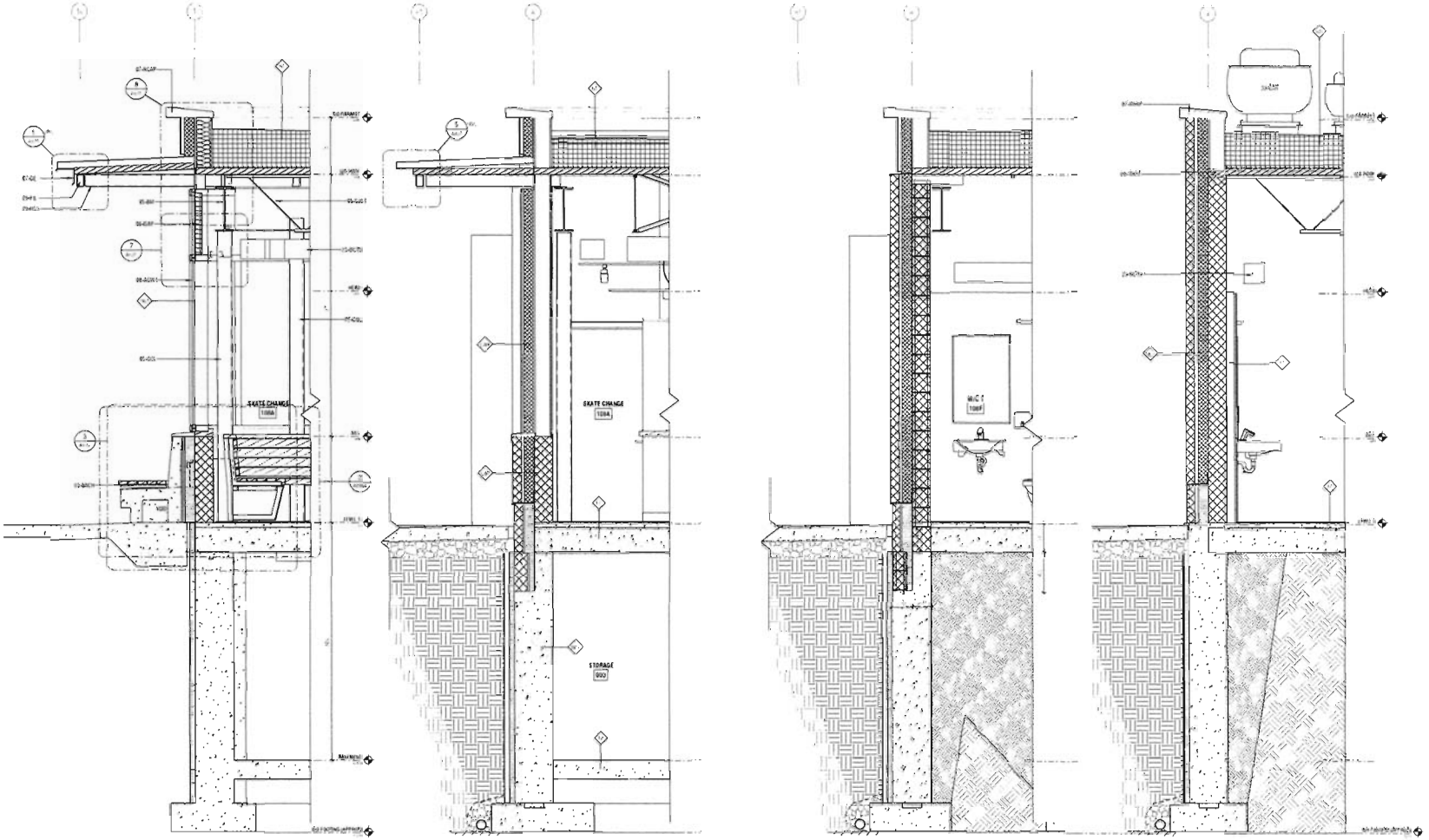
BrookMcIlroy

SHEET TITLE
PLAN/DETAILS

PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.
A701



5 WALL SECTION AT CURTAINWALL

1 WALL SECTION ALONG QUEEN

2 WALL SECTION ALONG QUEEN 2

3 WALL SECTION THROUGH ALLEY

NOTES:

No.	Date	Issued For
6	2022-02-25	Tender / Permit
5	2022-02-07	Sentinelant Coordination?
3	2021-10-04	Issued for Cost Estimate
2	2021-09-15	Issued for Sentinelant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

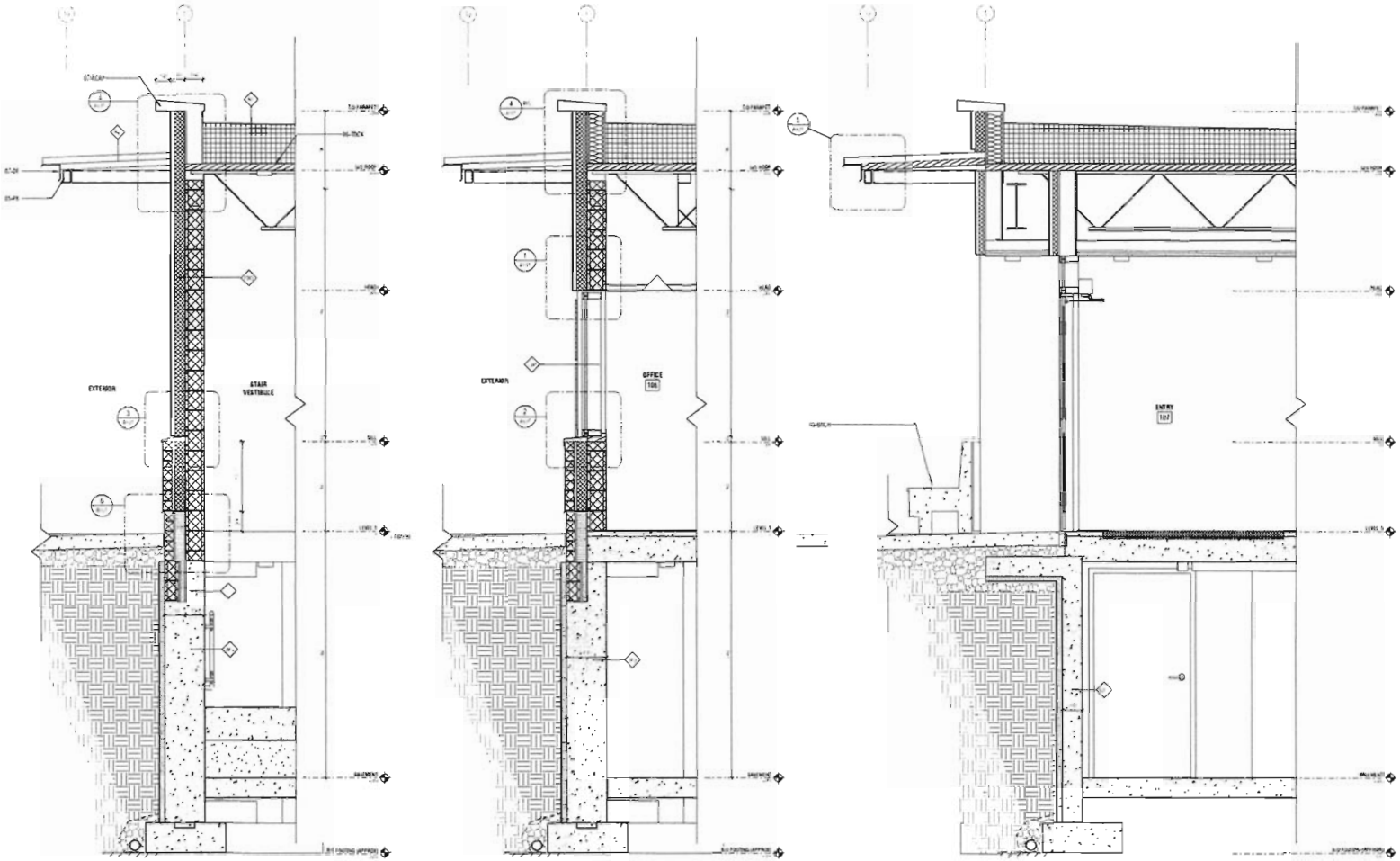
BrookMcIlroy/

WALL SECTIONS

19-076

2021-06-10

A602



1 WALL SECTION AT PLAZA1

2 WALL SECTION AT PLAZA

3a WALL SECTION AT ENTRANCE

NOTES:

AB-BRICH	PRECAST CONCRETE BENCH
AL-PW	HOT DIP GALVANIZED HSS RAISED TPE HEAD - REFER TO S STRUCTURAL
AL-TECH	S TRUCTURAL TIMBER DECK WITH CLEAR FINISH - REFER ALSO TO S STRUCTURAL
ST-GC	PREFINISHED GC TAIL DROP EDGE
ST-MCAP	PREFINISHED ROOF CAPPING

No.	Date	Issued For
6	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-10	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK
LICENCE
5413

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 7A2

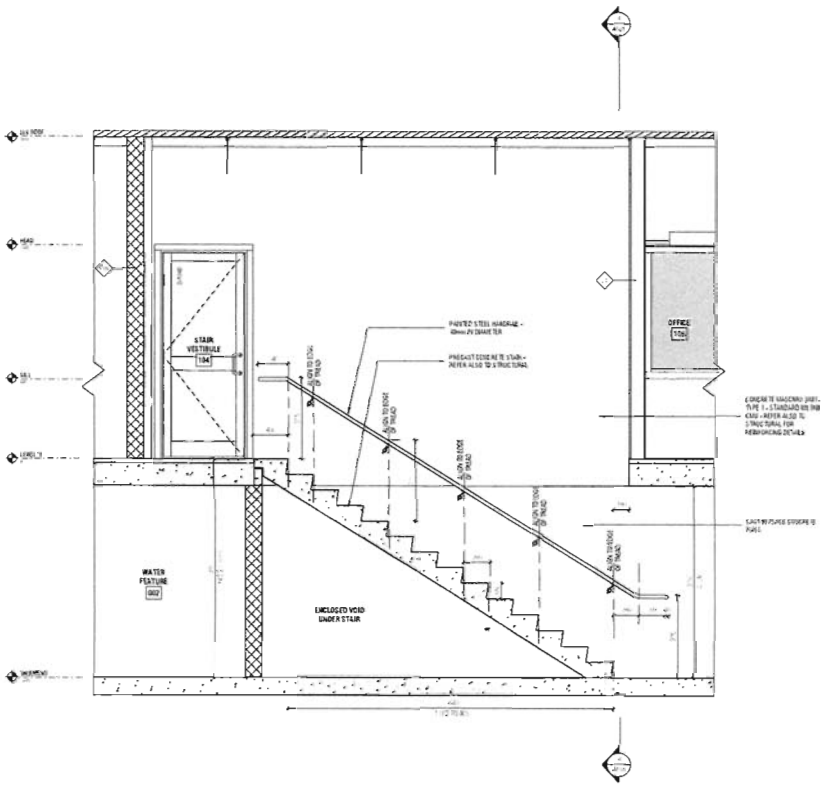
BrookMcIlroy/

SHEET TITLE
WALL SECTIONS

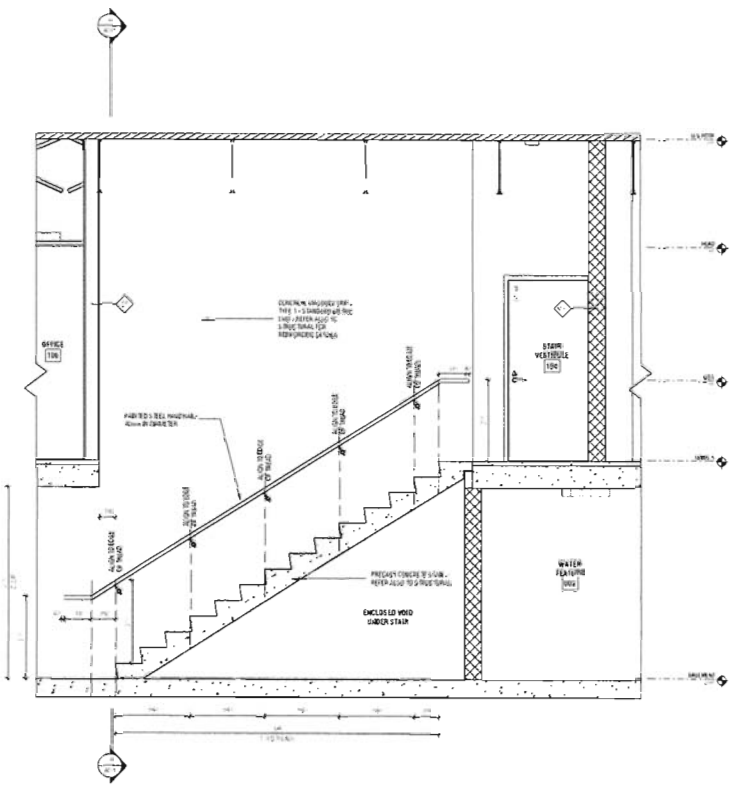
PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.
A601



1 STAIR SECTION 2
3/4" = 1'-0"



2 STAIR SECTION 3
1" = 1'-0"

NOTES:

No.	Date	Issued For
5	2022-02-25	Issued for Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CHUNG SHOON LICENCE 7415

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2Z6

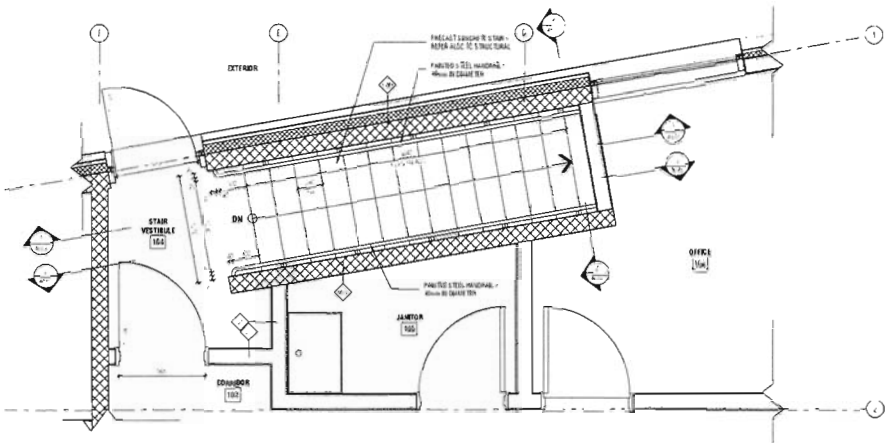
BrookMcIlroy

SHEET TITLE
STAIR DRAWINGS

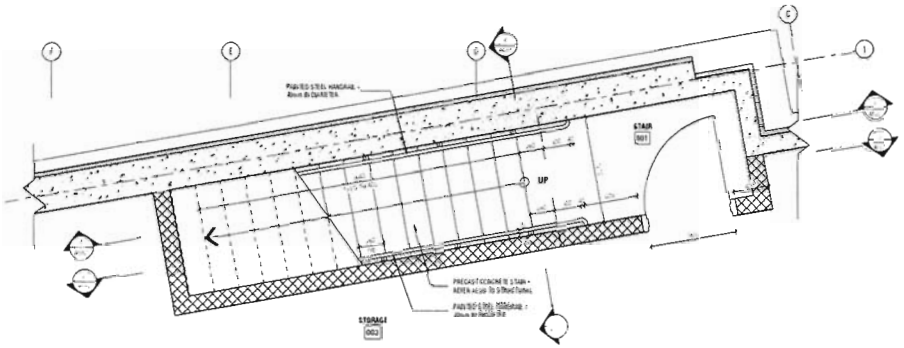
PROJECT NO. 19-076

DATE 2021-06-10

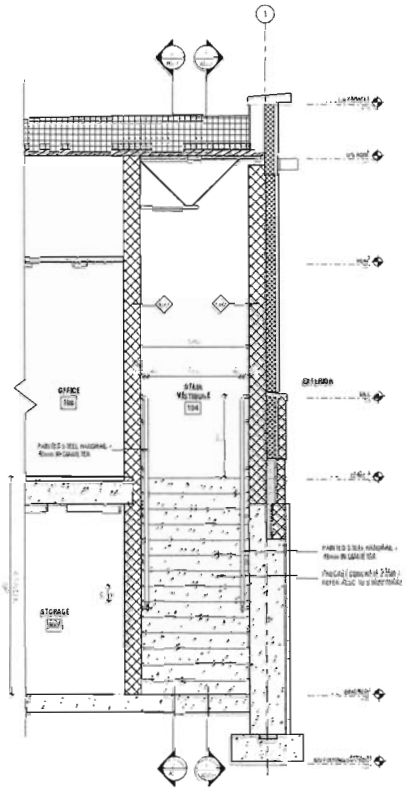
SHEET NO.
A502



2 ENLARGED STAIR PLAN - GROUND FLOOR



1 ENLARGED STAIR PLAN - BASEMENT



4 STAIR SECTION 1

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Updated for Client Comments
2	2021-09-13	Issued for Consultant Coordination

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON P6A 2A3

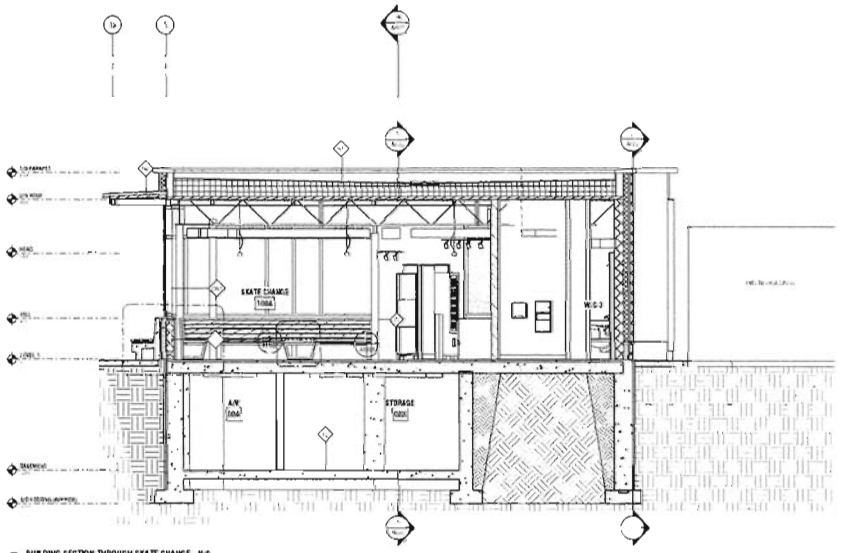
BrookMcIlroy/

STAIR DRAWINGS

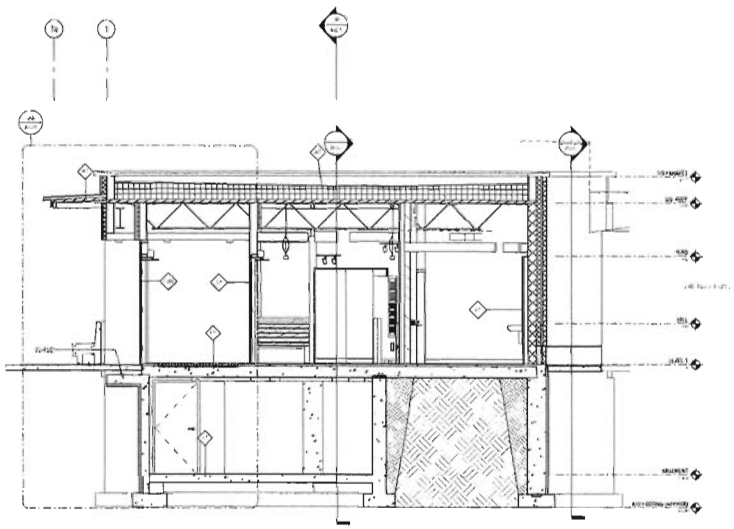
PROJECT No. 19-075

DATE 2021-06-10

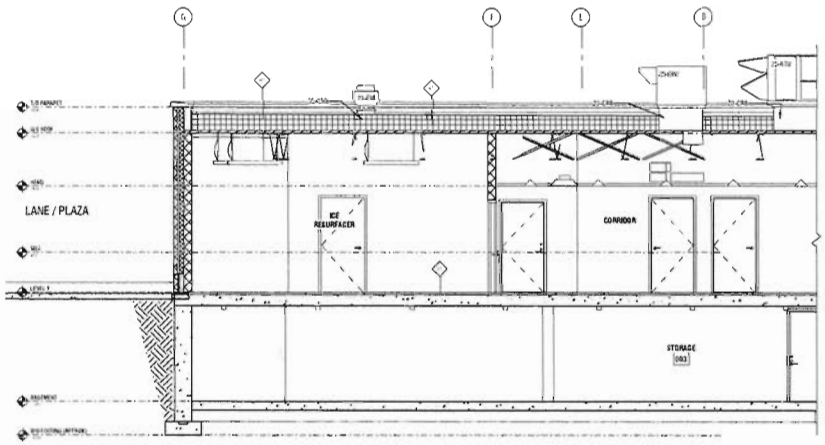
SHEET No. A501



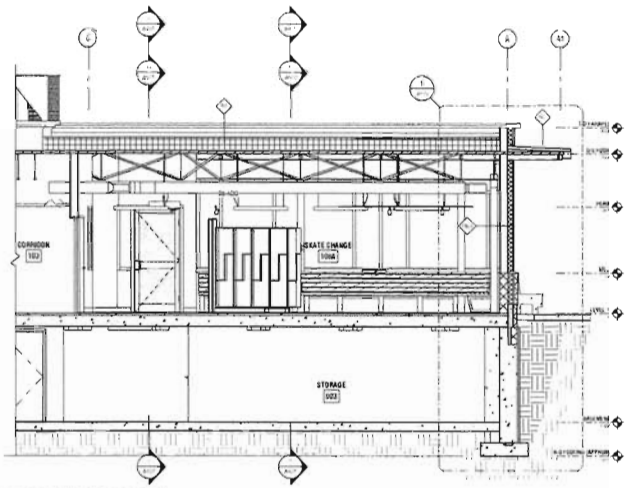
1 BUILDING SECTION THROUGH SKATE CHANGE - N/S



2 Building Section-North-South 2



2 BUILDING SECTION THROUGH SERVICES - E/W



3A SECTION THROUGH SKATE CHANGE - E/W

NOTES:

04 FSD	FLOOR SLAB DEPRESSION AT ENTRY (TO TRUE TO SLAB EXTERIOR PAVING
08-ADD	ADDITIONAL DOOR OPENING
23-CRB	PREFAB CURB - REFER TO MECHANICAL
23-EXH	EXHAUST FAN - REFER TO MECHANICAL

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK LICENCE 5445

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 3X3

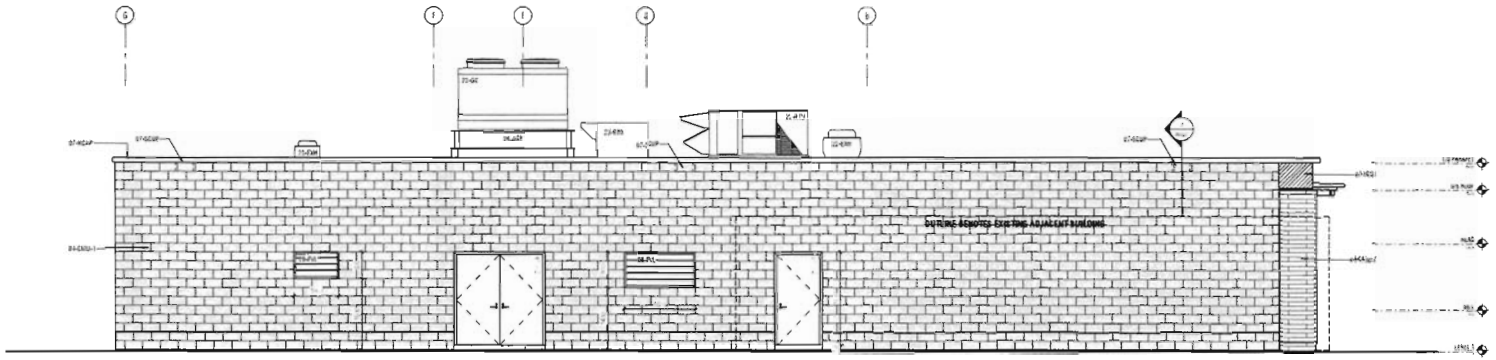
BrookMcIlroy/

SHEET TITLE
BUILDING SECTIONS

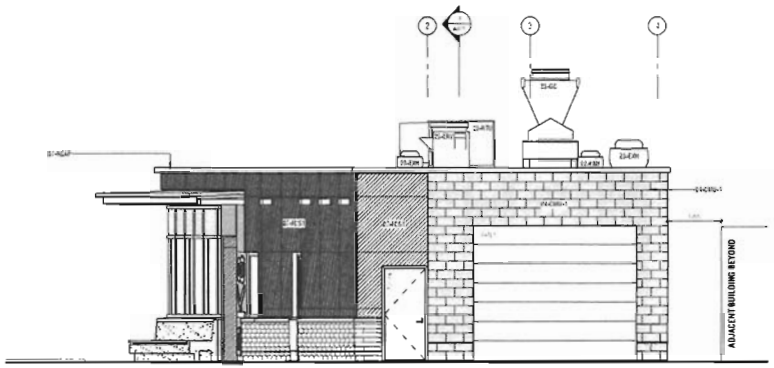
PROJECT NO. 19-076

DATE 2021-06-10

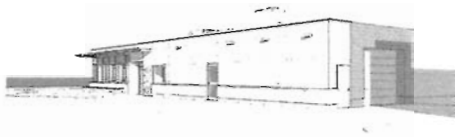
SHEET NO.
A401



1 SOUTH ELEVATION1



2 WEST ELEVATION



3 PERSPECTIVE VIEW FROM EXISTING PARK Copy 1

NOTES

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-06-10	Issued for Consultant Coordination
1	2021-05-10	Issued for Consultant Coordination

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 1Z1

BrookMcIlroy

SHEET TITLE

EXTERIOR ELEVATIONS

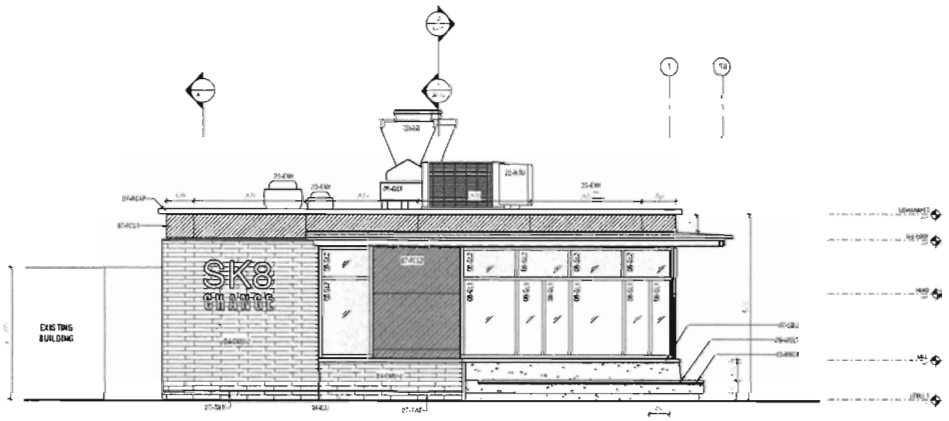
PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.

A302

1 NORTH ELEVATION



2 EAST ELEVATION

3 PERSPECTIVE VIEW FROM SKATING RINK

3 PERSPECTIVE VIEW FROM QUEEN STREET E

NOTES:

03-BNCH	PRECAST CONCRETE BENCH
04-CJ	CONTROL JOINT
04-CMU-1	CONCRETE MASONRY UNIT - TYPE 1 - STANDARD METRIC CMU - REFER ALSO TO STRUCTURAL FOR REINFORCING DETAILS
04-CMU-2	CONCRETE MASONRY UNIT - TYPE 2 - 190mm EXTERIOR CMU VENEER
04-SFD	CMU COOLER SUPPORT FRAME - H.D. GALV. STRUCTURAL FRAMING SUPPORTING EVP COOLER - REFER ALSO TO STRUCTURAL
05-EP	EXTERIOR BENCH - SOLID WOOD SLATS ON PRECAST CONCRETE BASE - REFER ALSO TO WALL DESIGN PACKAGE
06-WDL-2	CEDAR WOOD SLAT WITH CLEAR FINISH
07-FCS-1	6mm FACE FAS TONED FIBRE CEMENT CLADDING - COLOUR 1 - LIGHT GREY
07-FCS-2	6mm FACE FAS TONED FIBRE CEMENT CLADDING - COLOUR 2 - DARK GREY
07-RCAP	PREFINISHED ROOF CAPPING
07-SHL	PREFINISHED METAL SILL
07-TFL	PREFINISHED METAL THROUGH WALL FLASHING
08-GL1	GLASS TYPE 1 - LOW-E 25mm INSULATED GLAZED UNIT
08-GL2	GLASS TYPE 2 - 25mm REGULATED GLAZED UNIT WITH FROSTED LITE ON SURFACE 2
23-ERU	PREPACKAGED ROOFTOP ERV MOUNTED TO PREFAB ROOF CURB - REFER ALSO TO MECHANICAL
23-EXH	EXHAUST FAN - REFER TO MECHANICAL
23-GC	GAS COOLER BY OWNER - REFER TO REFRIGERATION DRAWINGS
23-RTU	PREPACKAGED ROOF TOP UNIT MOUNTED TO PREFAB ROOF CURB - REFER ALSO TO MECHANICAL
26-WW	WALL WASHER - REFER TO ELECTRICAL

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
ALAN BROOK
LICENCE
5415

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2X3

BrookMcIlroy/

SHEET TITLE

EXTERIOR ELEVATIONS

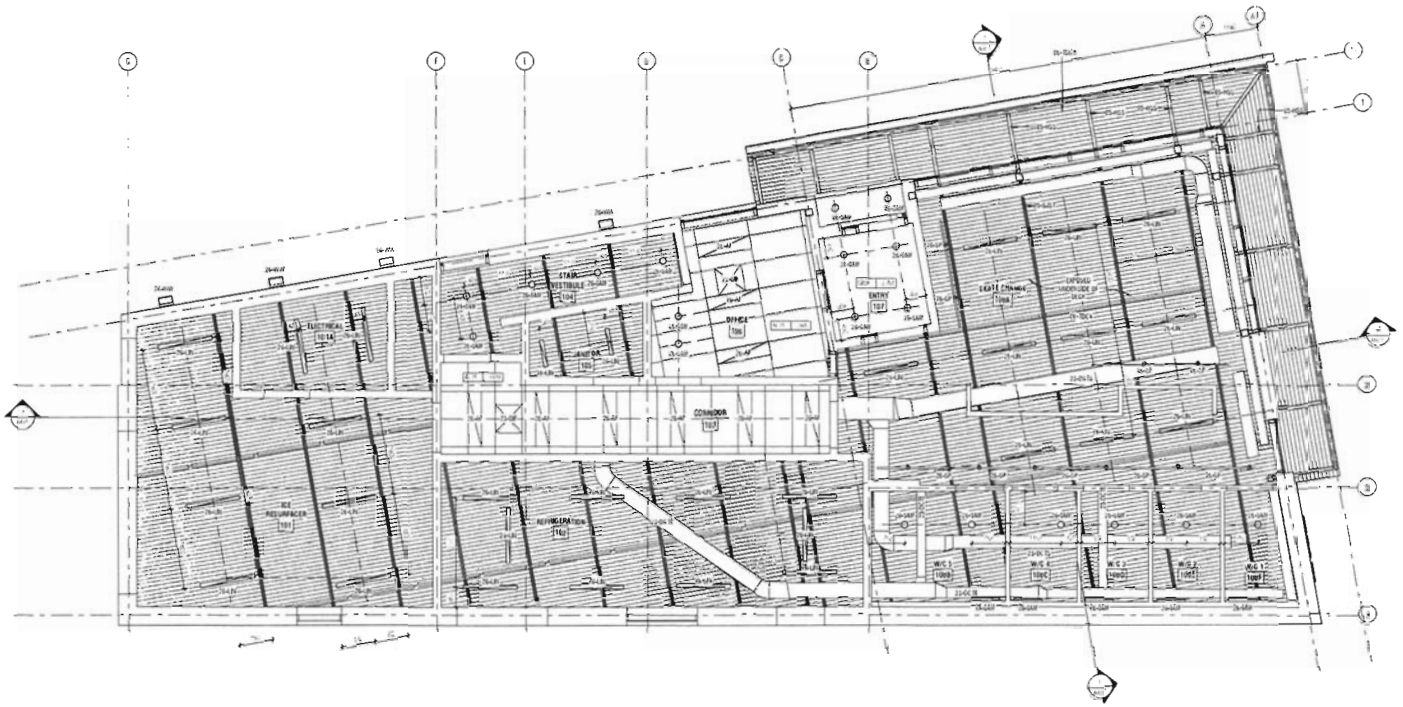
PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.

A301

NOTES:



No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-12-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 5N1

BrookMcIlroy/

SHEET TITLE

RCP - GROUND FLOOR

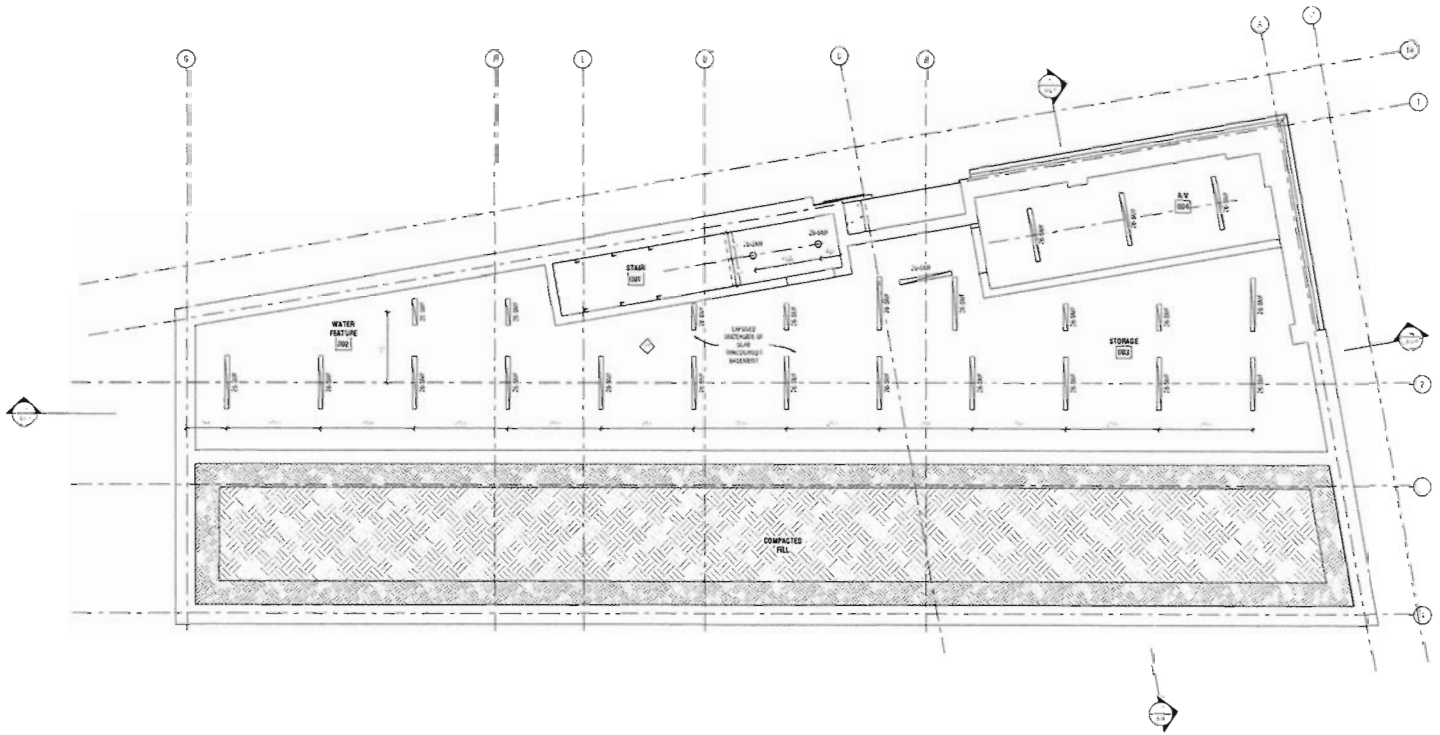
PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.

A211

1 LEVEL 1
1 : 50



1 BASEMENT

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-08-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A3

BrookMcIlroy/

SHEET TITLE

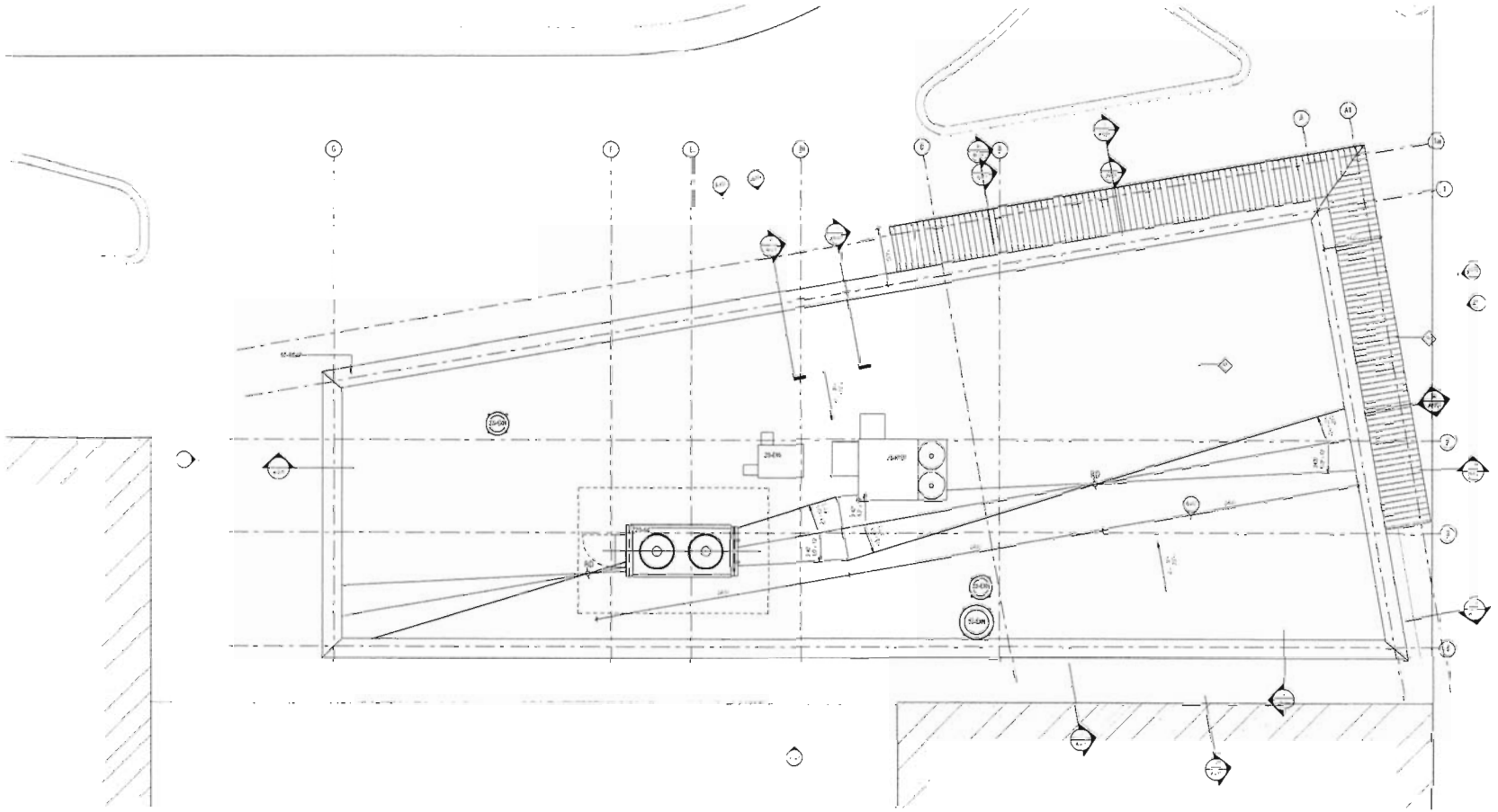
RCP - BASEMENT

PROJECT NO. 19-076

DATE 2021-08-10

SHEET NO.

A210



1 ROOF PLAN

NOTES:

No.	Date	Issued For:
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-06-18	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALUM BROOK
LICENCE
13419

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South and E St.
Mare, ON, P6A 2A3

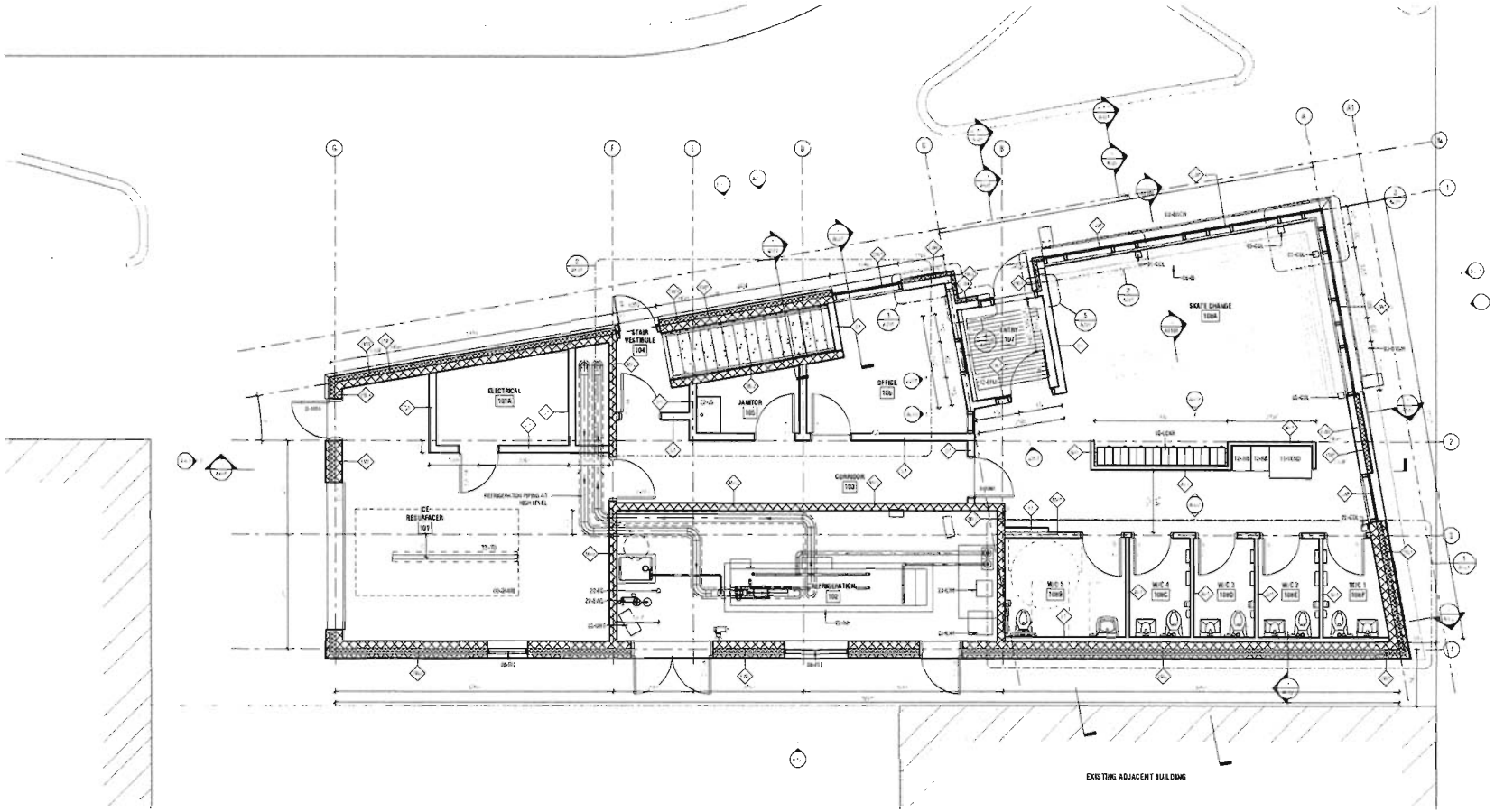
BrookMcIlroy

SHEET TITLE
ROOF PLAN

PROJECT NO. 19-076

DATE 2021-06-10

SHEET NO.
A202



1 GROUND FLOOR PLAN
1 : 50

NOTES

GS-DASH	DASHED LINE INDICATES EXTENT OF ICE RESURFACER IN PARKED POSITION
GS-BENCH	PRECAST CONCRETE BENCH
GS-RP	RAISED CONCRETE PODIUM - REFER ALSO TO STRUCTURAL
GS-COL	PAINTED STRUCTURAL STEEL COLUMN - REFER TO STRUCTURAL
GS-IB	INTERIOR BENCH - SOLID WOOD SLATS ON HOT DIP GALVANIZED STEEL FRAME - REFER ALSO TO MILLWORK PACKAGE
GS-RVL	FIXED VENTILATION LOUVRE - REFER ALSO TO MECHANICAL
GS-LOCK	DIGITAL L SHAPED LOCKERS
X1-VEND	VENDING MACHINE BY OWNER - REFER TO ELECTRICAL FOR POWER
GT-DAT	RECESSED DATAFRAME FLOOR BOX
X1-RB	RECYCLING BIN - BY OWNER
X1-WB	WASTE BIN - BY OWNER
P2-SAS	EMERGENCY SHOWER AND EYEWASH STATION - REFER TO PLUMBING DOCUMENTS
P2-FD	FLOOR DRAIN - REFER TO PLUMBING DOCUMENTS
P2-JS	JANITOR'S SINK
P2-TD	TRENCH DRAIN - REFER TO PLUMBING DOCUMENTS
P2-EXH	EXHAUST FAN - REFER TO MECHANICAL
P2-UH	UNIT HEATER - REFER TO MECHANICAL

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-09-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS — COLLIN BROOK LICENCE 5410

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A3

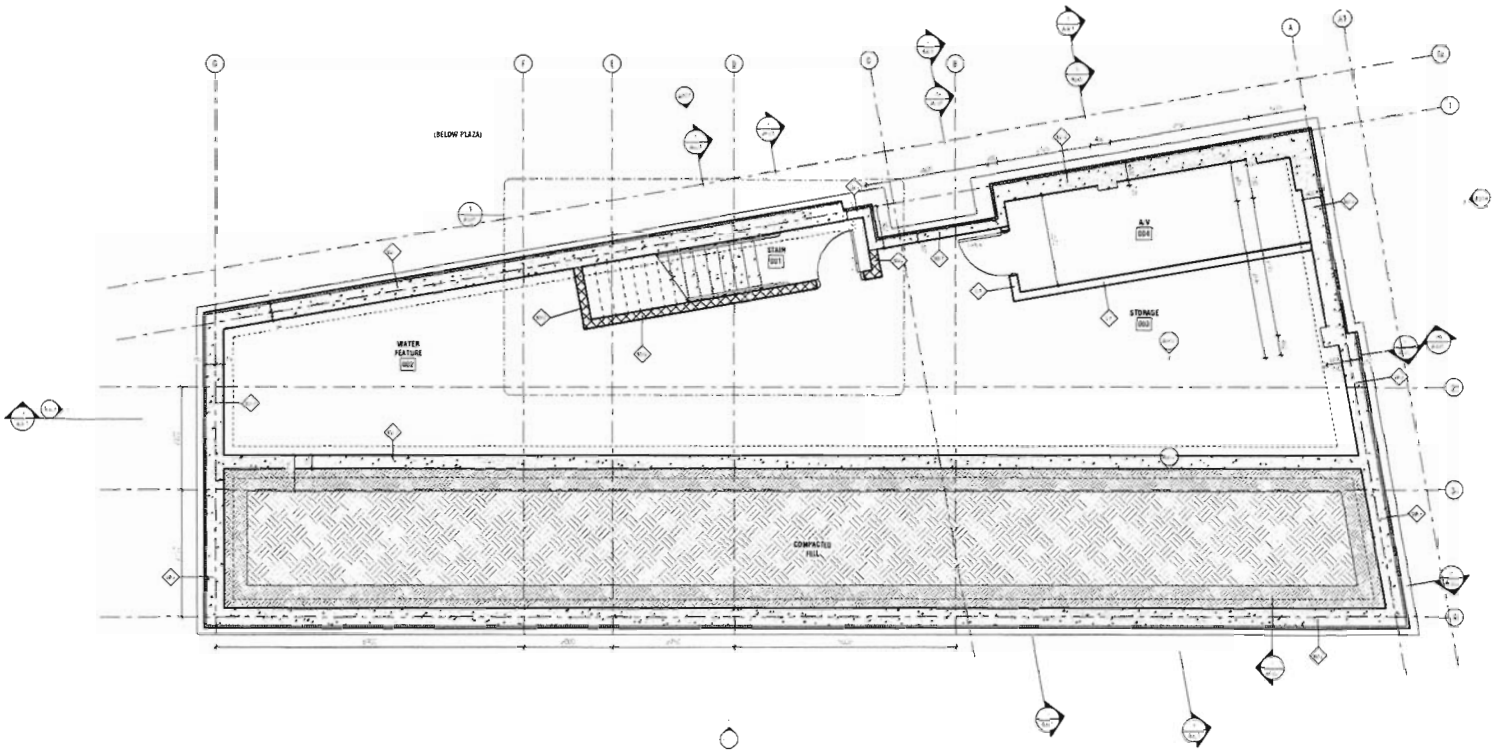
BrookMcIlroy/

SHEET TITLE
GROUND FLOOR PLAN

PROJECT NO. 19-078

DATE 2021-06-10

SHEET NO.
A201



1 BASEMENT PLAN
1 : 50

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Client Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS — CHERYL BROOK — LICENCE 5410

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2X3

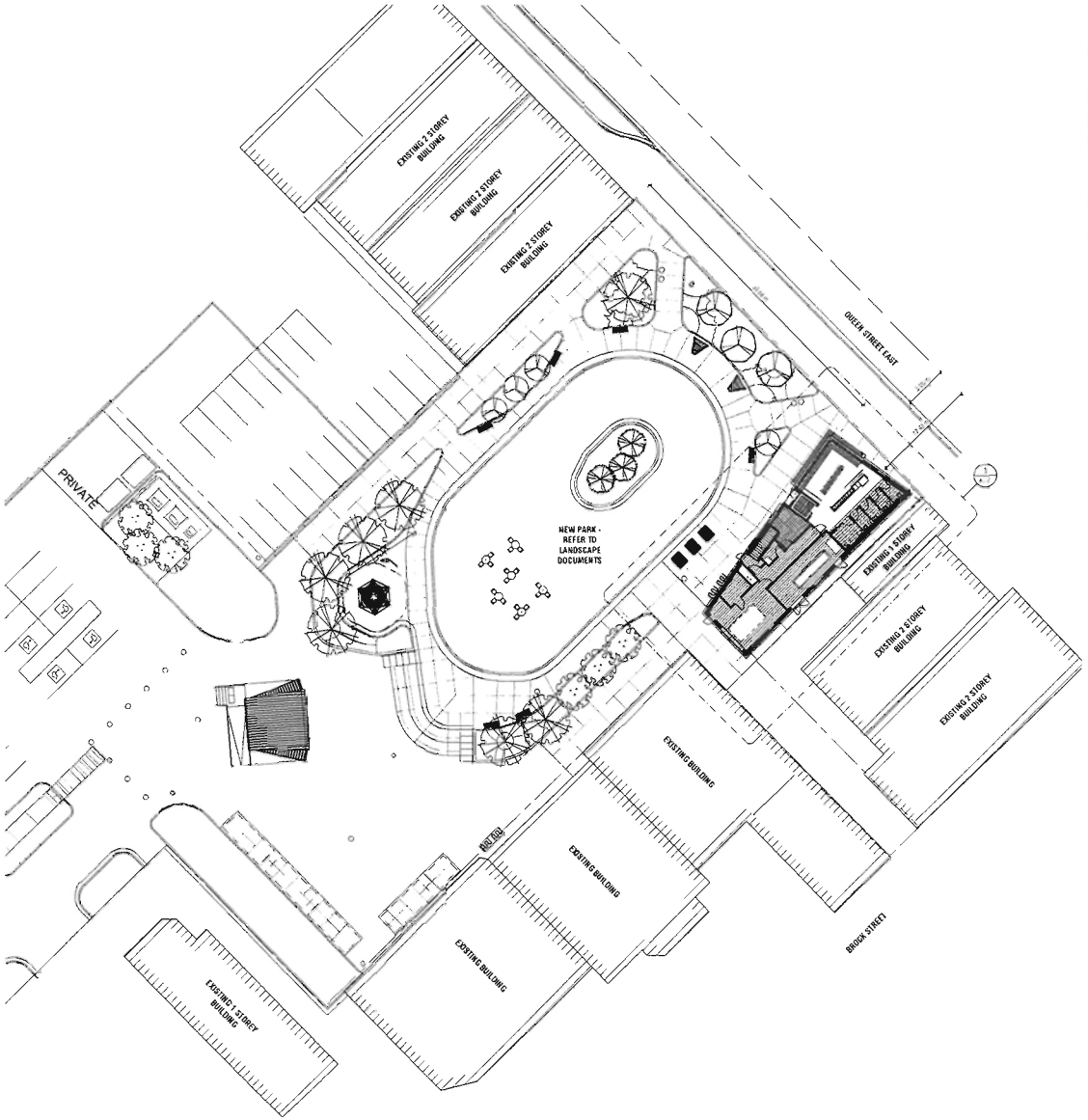
BrookMcIlroy

SHEET TITLE
BASEMENT PLAN

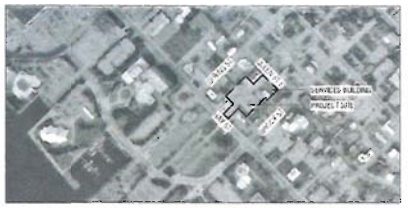
PROJECT NO. 19-079

DATE 2021-06-10

SHEET NO.
A200



1 Site Plan
1 : 750



2 SITE CONTEXT
1 : 1500

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK
LICENCE
5410

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A8

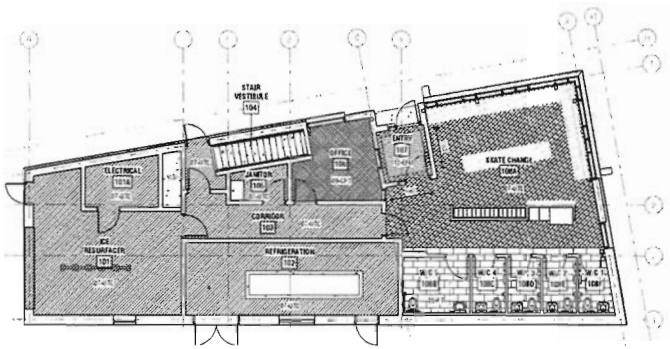
BrookMcIlroy/

SHEET TITLE
SITE PLAN

PROJECT NO. 19-078

DATE 2021-06-10

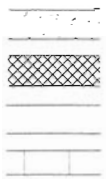
SHEET NO.
A101



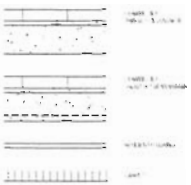
1 GROUND FLOOR FINISHES PLAN
1 : 100

HATCH LEGEND

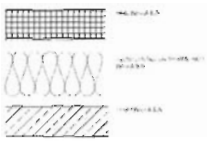
CONCRETE AND MASONRY



FLOOR MATERIALS AND FINISHES



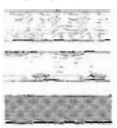
INSULATION



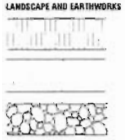
WALL MATERIALS AND FINISHES

METALS

WOODS & PLASTICS



LANDSCAPE AND EARTHWORKS



FINISHES LEGEND

ROOM FINISH GENERAL NOTES

Room Finish Schedule

Number	Name	Floor Material	Floor Finish	Base Material	Ceiling Material	Ceiling Finish	North Wall Finish	East Wall Finish	South Wall Finish	West Wall Finish	Comments
101		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
101A		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
102		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
103		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
104		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
105		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
106		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
106A		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
107		CONC	SLS	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
108		CONC	QT1	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
108A		CONC	QT1	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
108C		CONC	QT1	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
108D		CONC	QT1	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	
108F		CONC	QT1	SLS	GYPC	10'	10' GYPC	10' GYPC	10' GYPC	10' GYPC	

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-10	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CAMPBELL SHOOK
LICENCE
3445

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A3

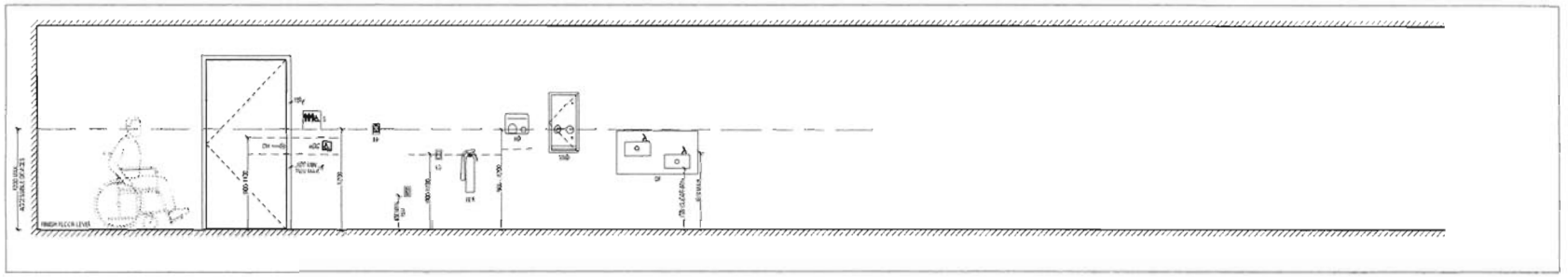
BrookMcIlroy/

SHEET TITLE
LEGENDS AND FINISH SCHEDULE

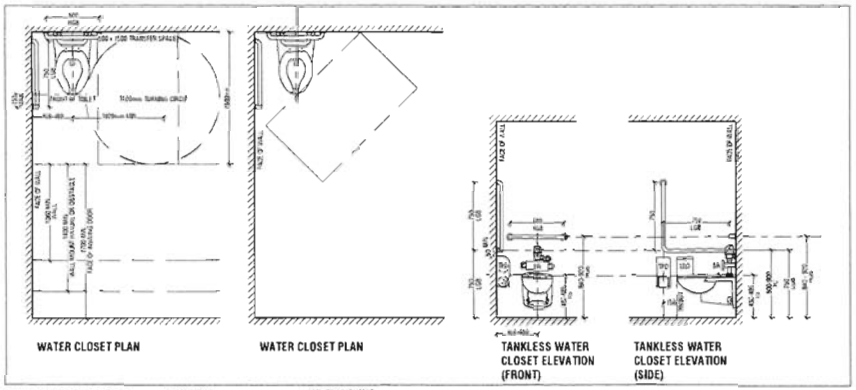
PROJECT NO. 19-076

DATE 2021-06-10

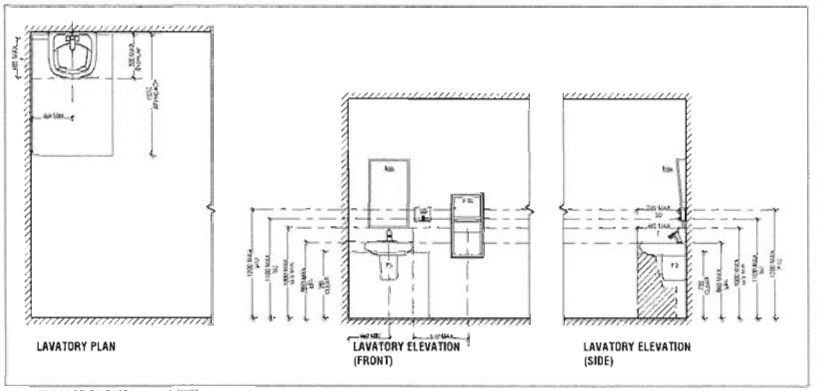
SHEET NO.
A005



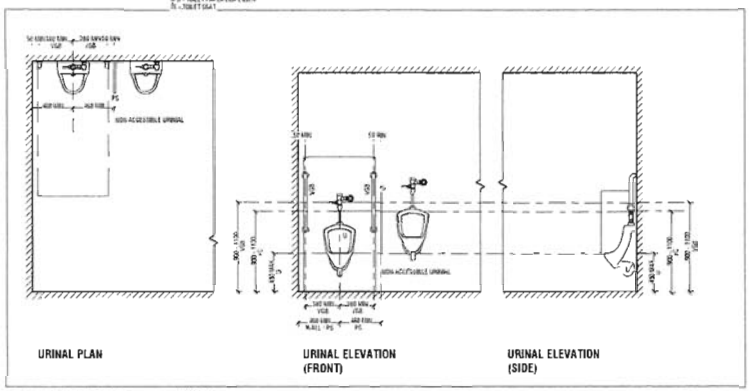
OBC BARRIER FREE
MOUNTING HEIGHTS
AND CLEARANCES



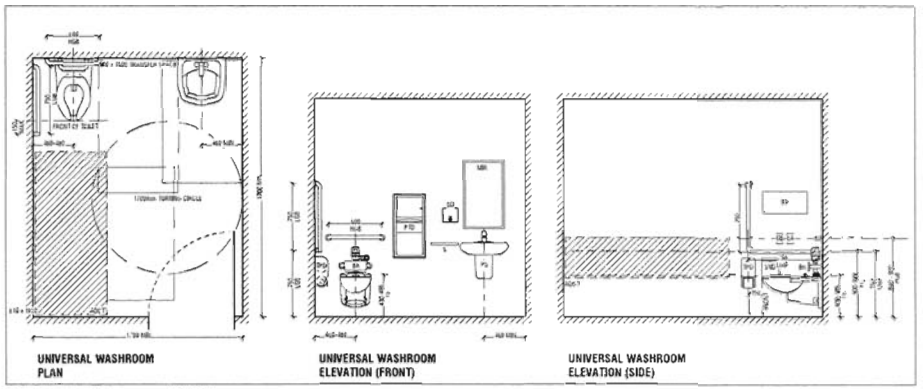
OBC BARRIER FREE
WATER CLOSET
REQUIREMENTS
(3.8.3.8)



OBC BARRIER FREE
LAVATORY
REQUIREMENTS
(3.8.3.11)



OBC BARRIER FREE
URINAL REQUIREMENTS
(3.8.3.10)



OBC UNIVERSAL
WASHROOM
REQUIREMENTS
(3.8.3.12)

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CHAN SHOCK
LICENCE
5419

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON P6A 2A8

BrookMcIlroy

SHEET TITLE
OBC W/C DIAGRAMS

PROJECT NO. 19-076

DATE 2021-06-10

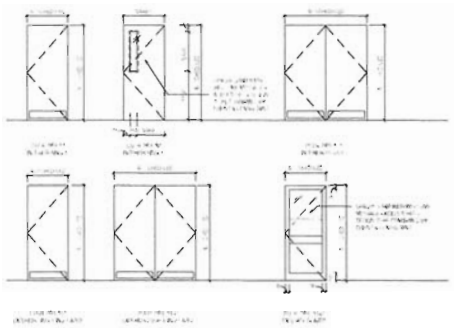
SHEET NO.
A004

DOOR AND FRAME SCHEDULE

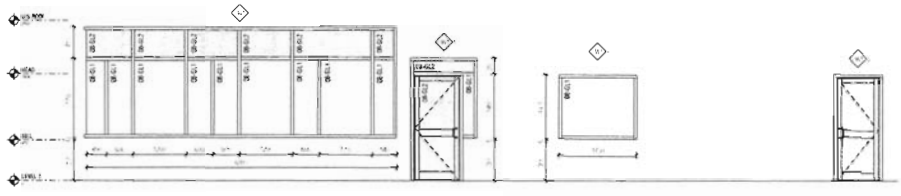
Door No	From Room: Name	Room Name	Door			Door			Frame				Fire Rating	Group	Comments
			Width	Height	Mat'l	Door Type	Finish	Glazing	Type	Mat'l	Finish	Glazing			
001															
004															
101															
102															
103															
104															
105															
106															
107															
108															
109															
110															
111															
112															
113															
114															
115															
116															
117															
118															
119															
120															
121															
122															
123															
124															
125															

GLAZING SCHEDULE

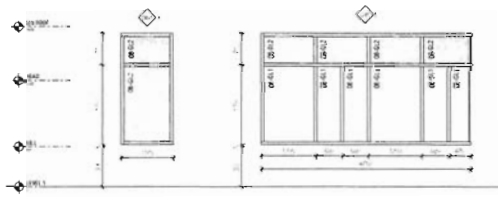
#	Location	Size: Height	Size: Width	Elevation	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					



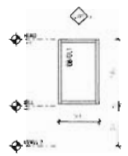
DOOR TYPE LEGEND



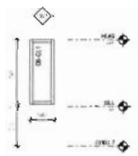
NORTH GLAZING



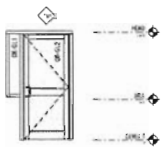
EAST GLAZING



GLAZING - OFFICE 1



GLAZING - OFFICE 2



INTERIOR VESTIBULE DOOR

NOTES:

GL-1 GLASS TYPE 1 - LOW-E 25mm INSULATED GLAZED UNIT

GL-2 GLASS TYPE 2 - 25mm INSULATED GLAZED UNIT WITH 2 LAYERS OF 10.38mm LAMINATED

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CHUAN SHOOK
LICENCE
5415

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A3

BrookMcIlroy/

SHEET TITLE

DOOR, FRAME AND GLAZING SCHEDULE

PROJECT NO. 19-076

DATE 2021-06-10

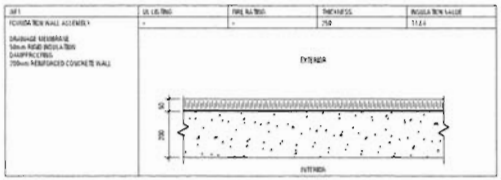
SHEET NO.

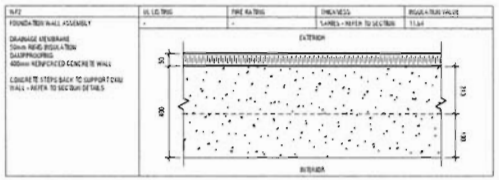
A003

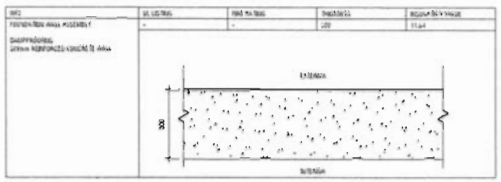
© Queen Street South Downtown Civic Plaza - Service Building Department, Sault Ste. Marie, ON

CONSTRUCTION ASSEMBLY TYPES

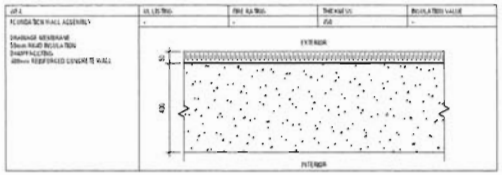
FOUNDATION WALLS

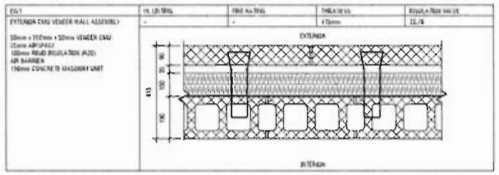


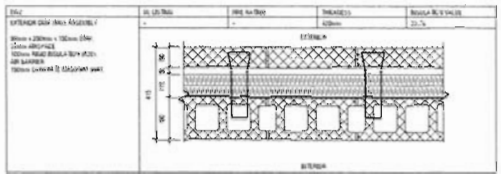


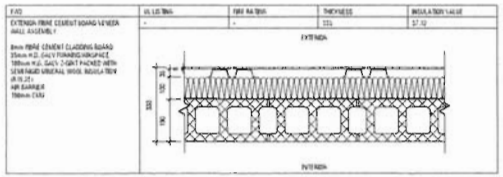


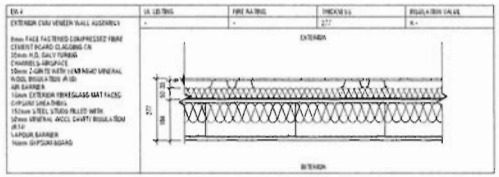
EXTERIOR WALLS



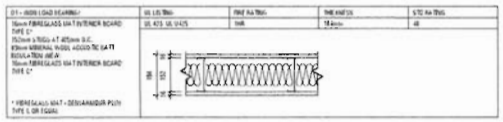




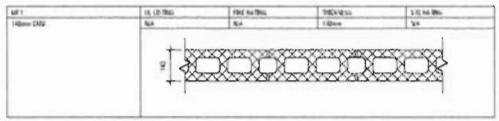


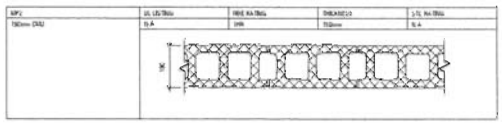


DEMISING WALLS

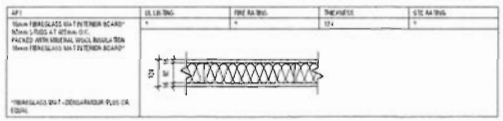


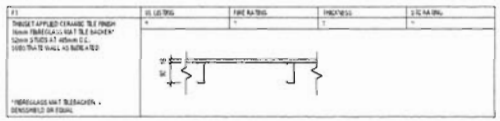
PARTITIONS



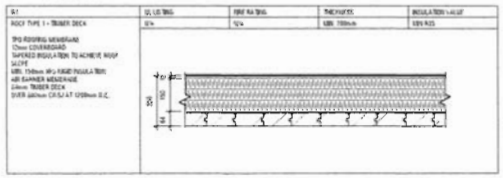


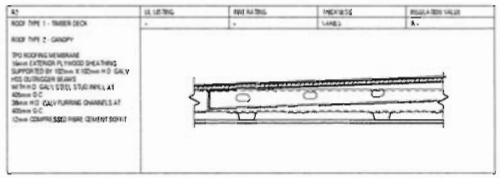
PARTITIONS





ROOF TYPES





NOTES:

No.	Date	Issued For
4	2022-02-07	Gateway/Land Development
3	2021-10-04	Issued for Cost Estimate
2	2021-09-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK
LICENCE
10410

SGM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Kault Ste. Marie, ON, P6A 2X6

BrookMcIlroy/

SHEET NAME
CONSTRUCTION ASSEMBLIES

PROJECT NO. 19-079

DATE 2021-06-10

SHEET NO.
A002

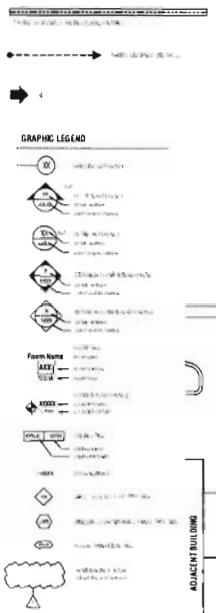
OBC MATRIX - PART 3

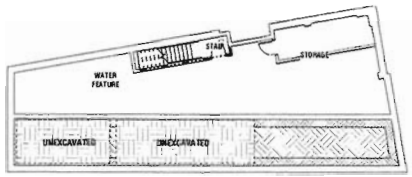
GENERAL NOTES

ABBREVIATIONS

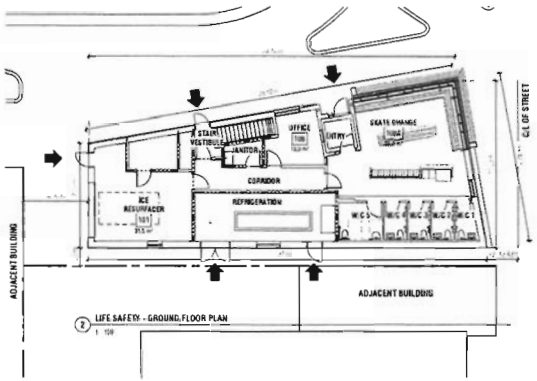
FIRE SEPARATION & TRAVEL DISTANCE LEGEND

GRAPHIC LEGEND





1 LIFE SAFETY - BASEMENT PLAN
1 : 150



2 LIFE SAFETY - GROUND FLOOR PLAN
1 : 150

NOTES:

No.	Date	Issued For
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK
LICENCE 5413

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON, P6A 2A5

BrookMcIlroy/

SHEET TITLE
OBC, GENERAL NOTES AND LIFE SAFETY

PROJECT no. 19-076

DATE 2021-06-10

SHEET NO.
A001

SAULT STE MARIE - DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street S, Sault Ste. Marie, ON P6A 2A3

LEAD CONSULTANT
ARCHITECT/LANDSCAPE

Brook McIlroy Incorporated

200-161 Spadina Avenue
Toronto, ON M5V 2L6
www.brookmcilroy.com

t. 416-504-5997
info@brookmcilroy.com

MECHANICAL AND
ASSOCIATE ARCHITECTS:

MGP Architects and Engineers

123 East Street
Sault Ste. Marie, ON P6A 3C7
www.mgp-arch-eng.ca

t. 705-942-9494

STRUCTURAL/CIVIL:

Tulloch Engineering

71 Black Rd #8
Sault Ste. Marie, ON P6B 0A3
www.tulloch.ca

t. 705-949-1457
saultstemarie@tulloch.ca

ELECTRICAL AND AV:

Mulvey and Banani

90 Sheppard Avenue East #500
Toronto ON M2N 3A1
www.mbii.com

t: 416-751-2520

REFRIGERATION:

CIMCO TOROMONT

65 Villiers St.
Toronto, ON M5A 3S1
www.cimcorefrigeration.com

t. 416-465-7581

LIST OF DRAWINGS

ARCHITECTURE

SHEET #	SHEET NAME	REV	REV DATE
A000	COVER	5	2022-02-25
G001	CIVIC GENERAL NOTES AND LIFE SAFETY	5	2022-02-25
A001.0	DOOR, FRAME AND GLAZING SCHEDULE	5	2022-02-25
A001.1	OBC H.E. DIAGRAMS	5	2022-02-25
A001.2	LEGENDS AND FINISH SCHEDULE	5	2022-02-25
A100.0	SITE PLAN	5	2022-02-25
A199	BASEMENT PLAN	5	2022-02-25
A200.1	GROUND FLOOR PLAN	5	2022-02-25
A200	ROOF PLAN	5	2022-02-25
A210	RCP - BASEMENT	5	2022-02-25
A211	RCP - GROUND FLOOR	5	2022-02-25
A300	EXTERIOR ELEVATIONS	5	2022-02-25
A300	EXTERIOR ELEVATIONS	5	2022-02-25
A400	BUILDING SECTIONS	5	2022-02-25
A501	STAIR DRAWINGS	5	2022-02-25
A502	STAIR DRAWINGS	5	2022-02-25
A601	WALL SECTIONS	5	2022-02-25
A602	WALL SECTIONS	5	2022-02-25
A701	PLAN DETAILS	5	2022-02-25
A801	SECTION DETAILS	5	2022-02-25
A802	SECTION DETAILS	5	2022-02-25
A901	INTERIORS	5	2022-02-25
A902	INTERIORS	5	2022-02-25
[illegible]	[illegible]	5	2022-02-25

MECHANICAL

SHEET #	SHEET NAME	REV	REV DATE
M0.1	PLUMBING NOTES, SCHEDULES DETAILS AND LEGENDS	3	FEB 23, 2022
M0.2	HVAC NOTES, SCHEDULES AND LEGENDS	3	FEB 23, 2022
M0.3	HVAC UNITS PLAN & SECTION MATERIAL DETAIL	3	FEB 23, 2022
M1.1	SANITARY AND DRAIN WASTE SHOP PIPING PLAN	2	FEB 22, 2022
M1.2	BASEMENT DOMESTIC HEATING PLAN	2	AUG 23, 2022
M1.3	GROUND FLOOR HYDRONIC AND ROOF REMOVAL GAS PIPING PLAN	2	FEB 23, 2022
M2.0	[illegible]	3	NOV 23, 2022

CIVIL DRAWINGS

SHEET #	SHEET NAME	REV	REV DATE
C1	EXISTING SITE PLAN AND REMOVALS	5	22-02-11
C2	GRADING PLAN	5	22-02-11
C3	SITE SERVICING PLAN	5	22-02-11
C4	NOTES AND DETAILS	5	22-02-11

STRUCTURAL DRAWINGS

SHEET #	SHEET NAME	REV	REV DATE
S1	SERVICE BUILDING STRUCTURAL GENERAL NOTES	3	22-02-18
S2	SERVICE BUILDING STRUCTURAL GENERAL NOTES	3	22-02-18
S3	SERVICE BUILDING STRUCTURAL FOUNDATION PLAN	3	22-02-18
S4	SERVICE BUILDING GROUND FLOOR PLAN	3	22-02-18
S5	SERVICE BUILDING STRUCTURAL ROOF PLAN	3	22-02-18
S6	SERVICE BUILDING FOUNDATION SECTIONS	2	22-02-18
S7	SERVICE BUILDING STRUCTURAL FOUNDATION SECTIONS	3	22-02-18
S8	SERVICE BUILDING STRUCTURAL BUILDING SECTIONS	3	22-02-18
S9	SERVICE BUILDING STRUCTURAL ROOF SECTIONS AND DETAILS	3	22-02-18
S10	SERVICE BUILDING STRUCTURAL - GLH DOOR SECTIONS & DETAILS	3	22-02-18

AUDIO VISUAL (A/V)

SHEET #	SHEET NAME	REV	REV DATE
AV-001	AUDIO VISUAL LEGEND, DRAWING LIST & GENERAL NOTES	2	22-02-18
AV-100	SITE PLAN - AUDIO VISUAL	2	22-02-18
AV-101	AUDIO VISUAL FUNCTIONAL DIAGRAM	2	22-02-18
AV-102	AUDIO VISUAL INFRASTRUCTURE RISER	2	22-02-18
AV-103	AUDIO VISUAL DETAILS	2	22-02-18
AV-104	AUDIO VISUAL SPECIFICATION SECTION 27 41 16 AUDIO VISUAL SYSTEMS	1	22-02-18
AV-105	SERVICE BUILDING BASEMENT - AUDIO VISUAL DETAILS	1	22-02-01
AV-106	AUDIO VISUAL DETAILS	1	22-02-01

ELECTRICAL

SHEET #	SHEET NAME	REV	REV DATE
E-001	LEGEND AND DRAWING LIST	3	22-02-18
E-002	ELECTRICAL SPECIFICATION	3	22-02-18
E-003	ELECTRICAL SPECIFICATION	3	22-02-18
E-100	SITE PLAN - ELECTRICAL	3	22-02-18
E-101	SERVICE BUILDING BASEMENT - LIGHTING	3	22-02-18
E-102	SERVICE BUILDING GROUND FLOOR - LIGHTING	2	22-02-18
E-201	SERVICE BUILDING BASEMENT - POWER AND SYSTEMS	3	22-02-18
E-202	SERVICE BUILDING GROUND FLOOR - POWER AND SYSTEMS	4	22-02-18
E-203	SERVICE BUILDING ROOF - ELECTRICAL	3	22-02-18
E-300	POWER DISTRIBUTION GROUND LINE RISER DIAGRAM	3	22-02-18
E-301	NATURAL TYPE LIGHT FIXTURES RISER DIAGRAM	3	22-02-18
E-400	ELECTRICAL DETAILS	3	22-02-18
E-401	ELECTRICAL DETAILS	2	22-02-18
E-402	ELECTRICAL DETAILS	2	22-02-18
E-403	PANELBOARD SCHEDULES	3	22-02-18
E-404	PANELBOARD SCHEDULES	3	22-02-18

REFRIGERATION

SHEET #	SHEET NAME	REV	REV DATE
R1000	GLYCOL PAD REFRIGERATION SYSTEM GENERAL NOTES, SPECIFICATIONS & PIPING DESCRIPTION	3	22-02-22
R1001	GLYCOL PAD REFRIGERATION SYSTEM EQUIPMENT & PIPING FLOW DIAGRAM (1 OF 2)	3	22-02-22
R1002	GLYCOL PAD REFRIGERATION SYSTEM EQUIPMENT & PIPING FLOW DIAGRAM (2 OF 2)	3	22-02-22
R1003	GLYCOL PAD REFRIGERATION SYSTEM WALL RISER ELEVATION DIAGRAMS	4	22-02-22
R2001	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM PLAN LAYOUT	4	22-02-22
R3001	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM PIPING LAYOUT	4	22-02-22
R3002	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM PIPING LAYOUT	4	22-02-22
R3003	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM PIPING LAYOUT	4	22-02-22
R3004	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM PIPING LAYOUT	4	22-02-22
R3005	GLYCOL PAD REFRIGERATION SYSTEM COOLING GLYCOL MAINS AND HEADS LAYOUT	4	22-02-22
R3006	GLYCOL PAD REFRIGERATION SYSTEM MECHANICAL ROOM SECTIONS	3	22-02-22

LANDSCAPE ARCHITECTURE

SHEET #	SHEET NAME	REV	REV DATE
L0.00	LANDSCAPE DRAWING INDEX	3	22-02-25
L0.01	EXISTING FEATURES AND DEMOLITION PLAN (1 OF 2)	3	22-02-25
L0.02	OVERALL LANDSCAPE PLAN	3	22-02-25
L1.01	MATERIALS AND FURNISHINGS PLAN A	2	22-02-25
L1.02	MATERIALS AND FURNISHINGS PLAN B	3	22-02-25
L1.03	ASPHALT PAVING ENLARGEMENT	3	22-02-25
L2.04	PLAYGROUND EQUIPMENT PLAN	3	22-02-25
L3.00	LAYOUT POINTS SCHEDULE	3	22-02-25
L3.01	LAYOUT PLAN A	3	22-02-25
L3.02	LAYOUT PLAN B	3	22-02-25
L4.00	LANDSCAPE DETAILS - PAVING	3	22-02-25
L4.01	LANDSCAPE DETAILS - FURNITURE	3	22-02-25
L4.02	LANDSCAPE DETAILS - AMPHITHEATRE	3	22-02-25
L4.03	LANDSCAPE DETAILS - SEATING WALL	3	22-02-25
L4.04	LANDSCAPE DETAILS - STAIR	3	22-02-25
L4.05	LANDSCAPE DETAILS - STAGE STRUCTURE	3	22-02-25
L4.06	[illegible]	3	22-02-25

NOTES:

No.	Date	Issued for
6	2022-02-25	Tender / Permit
5	2022-02-07	Consultant Coordination
4	2021-10-04	Issued for Cost Estimate
3	2021-09-13	Issued for Consultant Coordination
2	2021-06-10	Issued for Consultant Coordination
1	2021-05-18	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Sault Ste. Marie, ON P6A 2A3

BrookMcIlroy

SHEET TITLE
COVER

PROJECT No. 19-076
DATE 2021-06-10
SHEET No. **A000**

GENERAL NOTES:

INFORMATION PRESENTED ON THIS DRAWING IS BASED UPON INFORMATION RECEIVED FROM THE FOLLOWING SOURCES

- TOPOGRAPHIC DETAILS: TULLOCH
- EXISTING SERVICES: CITY OF SAULT STE. MARIE, PUC SERVICES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL EXISTING SERVICES AND UTILITIES PRIOR TO PROCEEDING WITH ANY WORK

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES

THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING SERVICE VALVES WITHOUT CONTACTING AND OBTAINING PERMISSION FROM THE SPECIFIC UTILITY OWNER

THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO PERFORMING ANY WORK AND MAKE THEMSELVES FULLY AWARE OF ALL EXISTING ON-SITE CONDITIONS

PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL RIGHT OF WAY, THE CONTRACTOR OR DEVELOPER WILL OBTAIN ALL NECESSARY PERMITS, AND APPROVALS FROM THE CITY

ALL DISTURBED AREAS WITHIN THE MUNICIPAL RIGHT OF WAY SHALL BE RESTORED TO THE ORIGINAL CONDITION OR BETTER AND TO THE SATISFACTION OF THE CITY

TRAFFIC CONTROL:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SHALL SUPPLY AND PROPERLY PLACE ALL SIGNS REQUIRED TO MAINTAIN TRAFFIC CONTROL. THE CONTRACTOR SHALL ENSURE THAT ALL SIGNS ARE ON THE SITE AND PROPERLY PLACED TWENTY-FOUR (24) HOURS PRIOR TO COMMENCEMENT OF ANY WORK. THE SIGNS AND PLACEMENT SHALL CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO TRAFFIC MANUAL.
- THE CONTRACTOR SHALL ALSO SUPPLY AND PLACE IN THE PROPER LOCATION ROUGH ROAD SIGNS, PROTRUDING MANHOLE SIGNS AND REDUCED SPEED LIMIT SIGNS AS REQUIRED.

SILTATION CONTROL PLAN NOTES:

SEDIMENT BARRIERS, CHECK DAMS, AND TEMPORARY CONSTRUCTION ACCESS TO BE INSTALLED PRIOR TO THE BEGINNING OF CONSTRUCTION.

ALL SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL AREAS ARE STABILIZED.

IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE

THE SITE WILL BE WET DOWN IF NECESSARY TO CONTROL DUST

ALL TOPSOIL STOCKPILES TO BE SURROUNDED WITH SEDIMENT CONTROL FENCING.

FILTER FABRIC TO BE PLACED UNDER GRATES ON ALL CATCH BASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL ALL CONSTRUCTION ACTIVITY IS COMPLETE. FILTER FABRIC FOR SILT CONTROL TO BE TERRA FIX 270R OR APPROVED EQUIVALENT.

WHERE CONSTRUCTION ACTIVITY TAKES PLACE WITHIN THE CITY RIGHT OF WAY, SEDIMENT CONTROLS WILL BE PLACED ON THE CATCH BASINS ON PUBLIC STREETS ACROSS THE PROPERTY'S FRONTAGE.

STREET SWEEPING, CATCH BASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE DEVELOPER AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE CITY.

SURFACE EROSION PROTECTION SHOULD BE APPLIED FOR ALL DISTURBED AREAS, SUBJECT TO EROSION , UNTIL VEGETATION IS ESTABLISHED.

DIMENSION NOTE:

- DIMENSIONS SHOWN ON THIS PLAN ARE TO BACK OF CURB IN PARKING, DRIVE-THRU AND ENTRANCE AREAS.
- BUILDING TIE DIMENSIONS ARE FROM NEW BUILDING FOUNDATION PERPENDICULAR TO PROPERTY LINES.

GRADING (SUB EXCAVATION):

- THE CONTRACTOR SHALL INCLUDE ALL LABOUR, EQUIPMENT AND MATERIAL TO EXCAVATE AND PLACE, AT LOCATIONS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE OWNER, ALL EARTH, ROCK AND GRANULAR MATERIAL AS NECESSARY TO COMPLETE THE PROJECT.

REMOVE ASPHALT:

- THE CONTRACTOR SHALL PROVIDE ALL LABOUR, EQUIPMENT AND MATERIAL REQUIRED TO REMOVE ASPHALT TO MATCH GRADE AT MUNICIPAL ROADS AND DRIVEWAYS AS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL ALSO INCLUDE THE DISPOSAL AND MANAGEMENT OF THE ASPHALT OFF SITE

REMOVE EXISTING CURB AND GUTTER:

- CONCRETE CURB AND GUTTER WILL BE REMOVED AND REPLACED FROM THE LOCATIONS INDICATED ON THE CONTRACT DRAWINGS.

CLASS I NON-WOVEN GEOTEXTILE:

THE CONTRACTOR SHALL INCLUDE A 0.50M OVERLAP AT ALL JOINTS. GEOTEXTILE SHALL BE PLACED AS SHOWN ON CONTRACT DRAWINGS AND SHALL EXTEND UP THE VERTICAL FACE OF THE EXCAVATION TO THE TOP OF THE EXCAVATION. GEOTEXTILE MATERIAL SHALL MEET OR EXCEED THE PHYSICAL REQUIREMENTS OF TERRAFIX 270R OR APPROVED EQUAL. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH THE BRAND, TYPE AND SPECIFICATIONS OF THE GEOTEXTILE PROPOSED FOR USE. GEOTEXTILE MATERIALS SHALL NOT BE PLACED ON SITE UNTIL THE ENGINEER PROVIDES THE CONTRACTOR APPROVAL IN WRITING FOR USE OF THE PROPOSED MATERIAL AND ACCEPTANCE OF SUBGRADE ELEVATION.

REMOVALS / DISPOSALS:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF UNSUITABLE AND SURPLUS EXCAVATED AND OTHER MATERIAL IN ACCORDANCE WITH O.REG. 406/19 AND OPSS. 180.

AGGREGATE SOURCES:

- ONLY MATERIAL OBTAINED FROM LICENSED GRAVEL OR SLAG AGGREGATE SOURCE WILL BE ACCEPTED IN THIS CONTRACT.

SUPPLY AND PLACE SUB-BASE:

- THE CONTRACTOR SHALL USE GRANULAR B TYPE I OR II IN ACCORDANCE WITH OPSS MUNI 1010 MATERIAL. THE CONTRACTOR SHALL PROVIDE ALL LABOUR, EQUIPMENT AND MATERIAL TO EXCAVATE TO THE PROPER DEPTH AS DIRECTED BY THE ENGINEER AND DISPOSE OF UNSUITABLE MATERIAL OFF SITE

GRANULAR "A":

- GRANULAR "A" WILL CONFORM TO OPSS MUNI 1010 EXCEPT 100% MUST PASS THE 22.4MM SIEVE. THE CONTRACTOR SHALL INCLUDE ALL LABOUR, EQUIPMENT AND MATERIAL NECESSARY TO SUPPLY, PLACE, COMPACT AND GRADE GRANULAR "A".

ASPHALT:

- THE CONTRACTOR SHALL PROVIDE A JOB MIX FORMULA MEETING ALL THE REQUIREMENTS AND SHALL BE ACCORDING TO OPSS 1150.04.01.02.
- THE CONTRACTOR SHALL BE REQUIRED TO CUT AND REMOVE ASPHALT PAVEMENT, A DISTANCE OF UP TO 1 METRE ON EXISTING ROAD SURFACES, ONLY DISTANCES OVER 1 METRE AS APPROVED BY THE ENGINEER SHALL BE REMOVED. ASPHALT SHALL BE CUT USING A SAW PRODUCING A STRAIGHT VERTICAL FACE.
- THE GRADE OF ASPHALT CEMENT TO BE USED SHALL BE PGAC 64-28 UNLESS OTHERWISE NOTED
- THE REQUIREMENTS OF OPSS 310 SHALL APPLY EXCEPT AS MODIFIED HEREIN.
- THE CONTRACTOR SHALL PROVIDE ALL LABOUR, MATERIAL AND EQUIPMENT REQUIRED TO COMPLETE THE WORK INCLUDING PROTECTION FROM TRAFFIC UNTIL SUFFICIENTLY COMPACTED AND CLEANING EXISTING PAVEMENT PRIOR TO PLACING OF SUBSEQUENT LIFTS.
- THE MIX PRODUCED SHALL CONFORM TO THE FOLLOWING MARSHALL STABILITY REQUIREMENTS:

MIX	TYP.	MARSHALL STABILITY MINIMUM N AT 60DC	% AIR VOIDS
HL3	SURFACE	12000	3-5
HLB	BINDER	12000	3-5

- ASPHALT CEMENT SHALL MEET THE REQUIREMENTS OF OPSS 1101
- THE MAXIMUM THICKNESS OF A LIFT OF ASPHALT SHALL BE THAT WHICH CAN PROPERLY BE COMPACTED TO OPSS.
- TACK COAT TO BE PROVIDED BETWEEN BINDER & SURFACE COURSE AS PER OPSS PROV. 308.

RESTORATION:

- ALL RESTORATION TO BE COMPLETED PER OPSS 492.
- ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITIONS OR BETTER.
- REFER TO LANDSCAPE DRAWINGS FOR ALL SURFACE FEATURES.

SEWER:

- BEDDING AND COVER SHALL CONFORM TO OPSD 802.010, 802.013 OR 802.014. BEDDING AND COVER MATERIAL TO BE GRANULAR 'A' COMPACTED TO MIN. 95% OF THE MATERIAL'S SPMDD IN LIFTS OF 150mm MAXIMUM. IF HEAVY GROUNDWATER ENCOUNTERED USE 19mm CLEAR STONE WRAPPED IN FILTER CLOTH AS DIRECTED BY THE ENGINEER.
- ALL SEWER PIPE SHALL BE DR28 PVC

PRECAST CONCRETE MANHOLES AND CATCHBASINS INCLUDING FRAMES AND GRATES:

- PRECAST CONCRETE MANHOLES SHALL CONFORM TO OPSD 400.010, 401.010, 701.010, 701.011, 701.012, 701.013, AND 705.010 AND THAT SPECIFIED ON THESE DRAWINGS. WHERE PRECAST BASES ARE USED ON THIS PROJECT THE REQUIRED OPENINGS SHALL BE SET AT THE TIME OF CASTING. SHOULD THE PRECAST OPENINGS NOT BE AS SPECIFIED, OPENINGS MADE ON SITE SHALL BE A CUT INTO THE PRECAST SECTION USING A CORING TOOL CAPABLE OF CUTTING A NEAT ROUND OPENING SUFFICIENT TO ACCOMMODATE THE PIPE TO BE USED. PRECAST STRUCTURES TO BE INCORPORATED INTO THIS WORK SHALL NOT BE SUBJECTED TO IMPACT BY ANY MEANS, MECHANICAL OR MANUAL. FRAMES AND COVERS SHALL BE ADJUSTED TO FINAL GRADE BY MEANS OF PRECAST ADJUSTING RINGS ONLY. WHERE SHIMS ARE USED FOR FINE ADJUSTMENT, ONLY STEEL SHIMS SHALL BE USED. CONTRACTOR TO PROVIDE PRECAST CONCRETE ADJUSTMENT RINGS AS PER OPSD 704.010.

WATER SERVICING:

1. ALL WORK SHALL CONFORM TO PUC STANDARDS AND SPECIFICATIONS LATEST VERSION.
2. DEPTH OF COVER SHALL BE 2.2m TO TOP OF PIPE. OTHERWISE PIPE MUST BE INSULATED.
3. WATERMAINS CROSSING UNDER SEWERS TO HAVE A MINIMUM 0.5m VERTICAL SEPARATION.
4. WATERMAINS CROSSING ABOVE SEWERS TO HAVE A MINIMUM 0.15m VERTICAL SEPARATION.
5. WATERMAINS TO HAVE A MINIMUM 2.5m HORIZONTAL CLEARANCE FROM SEWERS AND ASSOCIATED STRUCTURES.
6. CONSULTANT AND PUC TO WITNESS WATER SERVICE COMMISSIONING
7. JOINT RESTRAINTS REQUIRED AS PER TABLES.

REPAIR CLAMPS:

- AN APPROVED STAINLESS STEEL REPAIR CLAMP SHALL BE INSTALLED ON ANY EXISTING SEWER WHICH MAY BE REQUIRED TO COMPLETE THE PROJECT.

PROTECTION AND SUPPORT OF GAS MAINS:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PROTECTION AND SUPPORT OF UTILITIES AS REQUIRED AND AS DIRECTED BY THE UTILITIES REPRESENTATIVE. BACKFILL AND BEDDING SHALL BE PLACED USING PROPER PLACEMENT AND COMPACTION PROCEDURES TO THE SATISFACTION OF THE UTILITY REPRESENTATIVE INVOLVED.

TACTILE WARNING PLATES:

- ALL TACTILE WARNING PLATES SHALL CONFORM TO OPSD 310.039

LINE PAINTING:

1. LINE PAINTING TO BE COMPLETED AS PER OPSS 710 AND 2011 STANDARDS.
REFLECTIVE BEADS AS PER OPSS

MATERIALS TESTING AND INSPECTIONS:

- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL MATERIALS TESTING AND INSPECTIONS WITH A CCIL CERTIFIED LABORATORY.
- TESTING SHALL BE COMPLETED ON ASPHALT, CONCRETE AND AGGREGATES AT THE DISCRETION OF THE ENGINEER AND MEET THE REQUIREMENTS NOTED ON THE CONTRACT DRAWINGS AND/OR APPLICABLE OPSS.

ANY DEFECTIVE AREAS SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE ENGINEER.

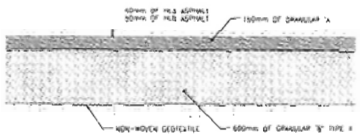
Plug End, Tee Branch, Water Valve or Hydrant Lead	
Diameter (mm)	Restrained Length (m)
150	9.1

Reducer Size (mm x mm)	Minimized Length* (m)
150 x 100	4.5

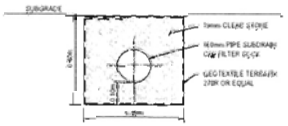
*Indicates length from the larger end of the reducer (on the larger pipe)

Bends			
	Restrained Length (m)		
Pipe Diameter (mm)	90° Bend	45° Bend	22.5° Bend
150	4.0	1.7	0.8

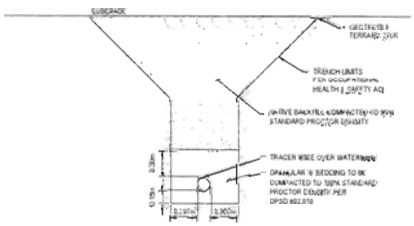
WATERMAIN JOINT RESTRAINT REQUIREMENTS



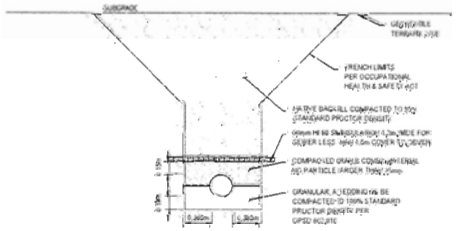
QUEEN STREET RESTORATION (SECTION)
SCALE 1:25



SUBDRAIN - TYPICAL
SCALE 1:10



WATERMAIN TRENCH DETAIL
SCALE 1:25



SEWER TRENCH DETAIL
SCALE 1:25

KEY PLAN

ENGINEER'S SEAL:

DATE	REV.	REVISION	BY	APP'D
22.02.28	0	ISSUED FOR TENDER	AS	ML

CLIENT:

BROOKMcILROY
161 SPADINA AVE.
TORONTO, ON

CONSULTANT:

TULLOCH ENGINEERING

PROJECT TITLE:

DOWNTOWN PLAZA

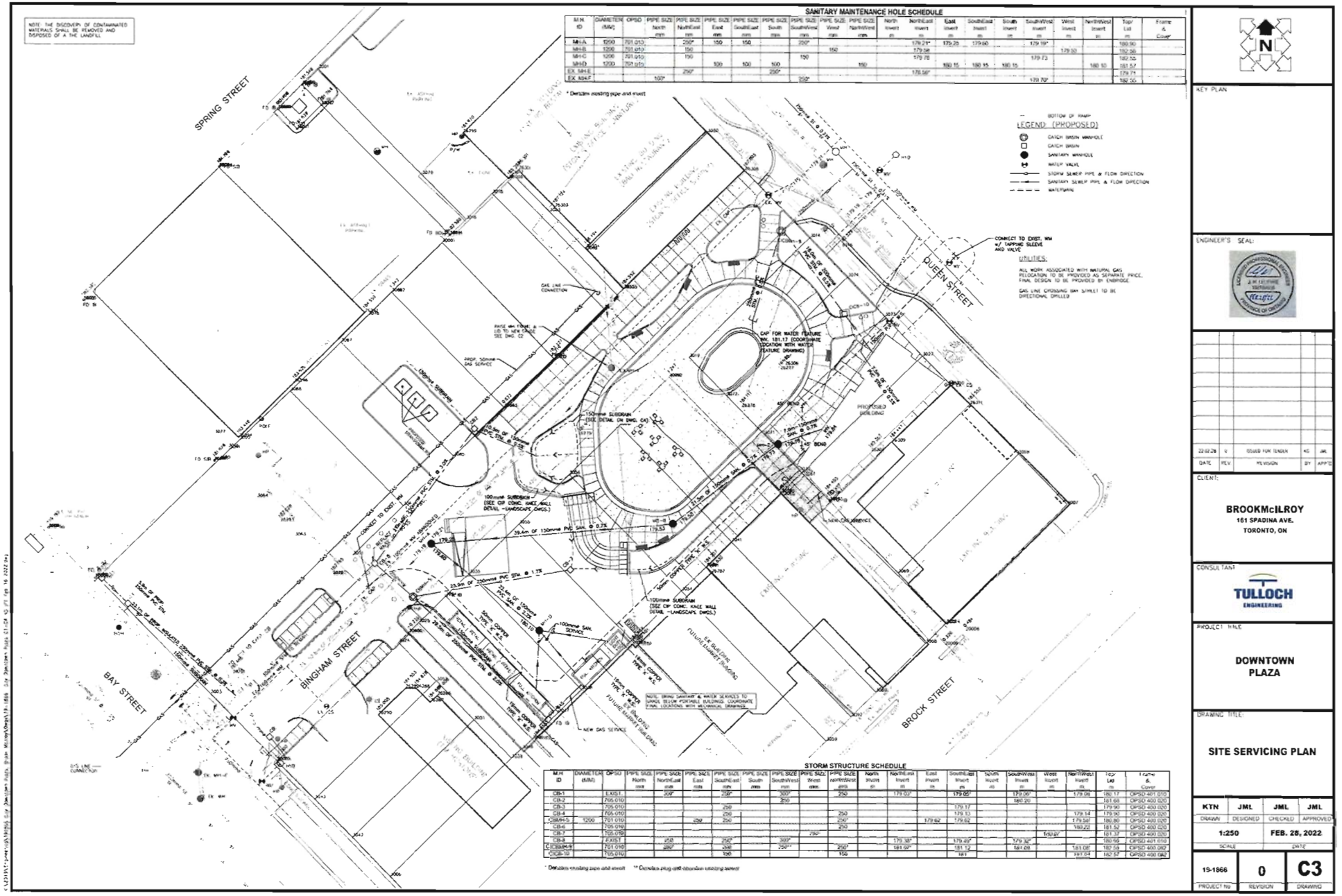
DRAWING TITLE:

NOTES AND DETAILS

KTN	JML	JML	JML
DRAWN	DESIGNED	CHECKED	APPROVED

1:250	FEB. 28, 2022
SCALE	DATE

19-1866	0	C4
PROJECT NO.	REVISION	DRAWING



SANITARY MAINTENANCE HOLE SCHEDULE

M.H. ID	DIAMETER (MM)	OPSD	PIPE SIZE North mm	PIPE SIZE NorthEast mm	PIPE SIZE East mm	PIPE SIZE SouthEast mm	PIPE SIZE South mm	PIPE SIZE SouthWest mm	PIPE SIZE West mm	PIPE SIZE NorthWest mm	North Invert m	NorthEast Invert m	East Invert m	SouthEast Invert m	South Invert m	SouthWest Invert m	West Invert m	NorthWest Invert m	Top/ Lid m	Frame & Cover
MH-A	1200	701.013		250*	150	150		200*				179.21*	179.25	179.60		179.19*			180.90	
MH-B	1200	701.013		150						150		179.96					179.32		182.56	
MH-C	1200	701.013		150			150					179.76				179.73			182.52	
MH-D	1200	701.010			100	100	100		150				180.15	180.15	180.15			180.10	181.57	
EX. MH-E				250*			250*					178.56*							179.71	
EX. MH-F			100*					250*								179.70*			182.50	

* Denotes existing pipe and invert

STORM STRUCTURE SCHEDULE

M.H. ID	DIAMETER (MM)	OPSD	PIPE SIZE North mm	PIPE SIZE NorthEast mm	PIPE SIZE East mm	PIPE SIZE SouthEast mm	PIPE SIZE South mm	PIPE SIZE SouthWest mm	PIPE SIZE West mm	PIPE SIZE NorthWest mm	North Invert m	NorthEast Invert m	East Invert m	SouthEast Invert m	South Invert m	SouthWest Invert m	West Invert m	NorthWest Invert m	Top/ Lid m	Frame & Cover
CB-1		EXIST.		300*		250*		300*		250		179.00*		179.05*		179.06*		179.08	180.17	OPSD 401.010
CB-2		705.010						250								180.20			181.68	OPSD 400.020
CB-3		705.010				250								179.17					179.90	OPSD 400.020
CB-4		705.010				250				250				179.13				179.14	179.90	OPSD 400.020
CBMH-5	1200	701.010			250	250				250*			179.62	179.62				179.58*	180.80	OPSD 400.020
CB-6		705.010								250								180.22	181.52	OPSD 400.020
CB-7		705.010						250*									180.07		181.37	OPSD 400.020
CB-8		EXIST.	250		250*		300*					179.38*		179.49*		179.34*			180.99	OPSD 401.010
CBMH-9		701.010	250*		250		250*		250*			181.12		181.08		181.08		181.08	182.59	OPSD 400.060
CB-10		705.010			150				150			181						181.04	182.57	OPSD 400.060

* Denotes existing pipe and invert ** Denotes plug and abandon existing lateral

KEY PLAN

ENGINEER'S SEAL:

DATE	REV.	REVISION	BY	APP'D
22.02.28	0	ISSUED FOR TENDER	KG	JML

CLIENT:

BROOKMcILROY
161 SPADINA AVE.
TORONTO, ON

CONSULTANT

TULLOCH ENGINEERING

PROJECT TITLE:

DOWNTOWN PLAZA

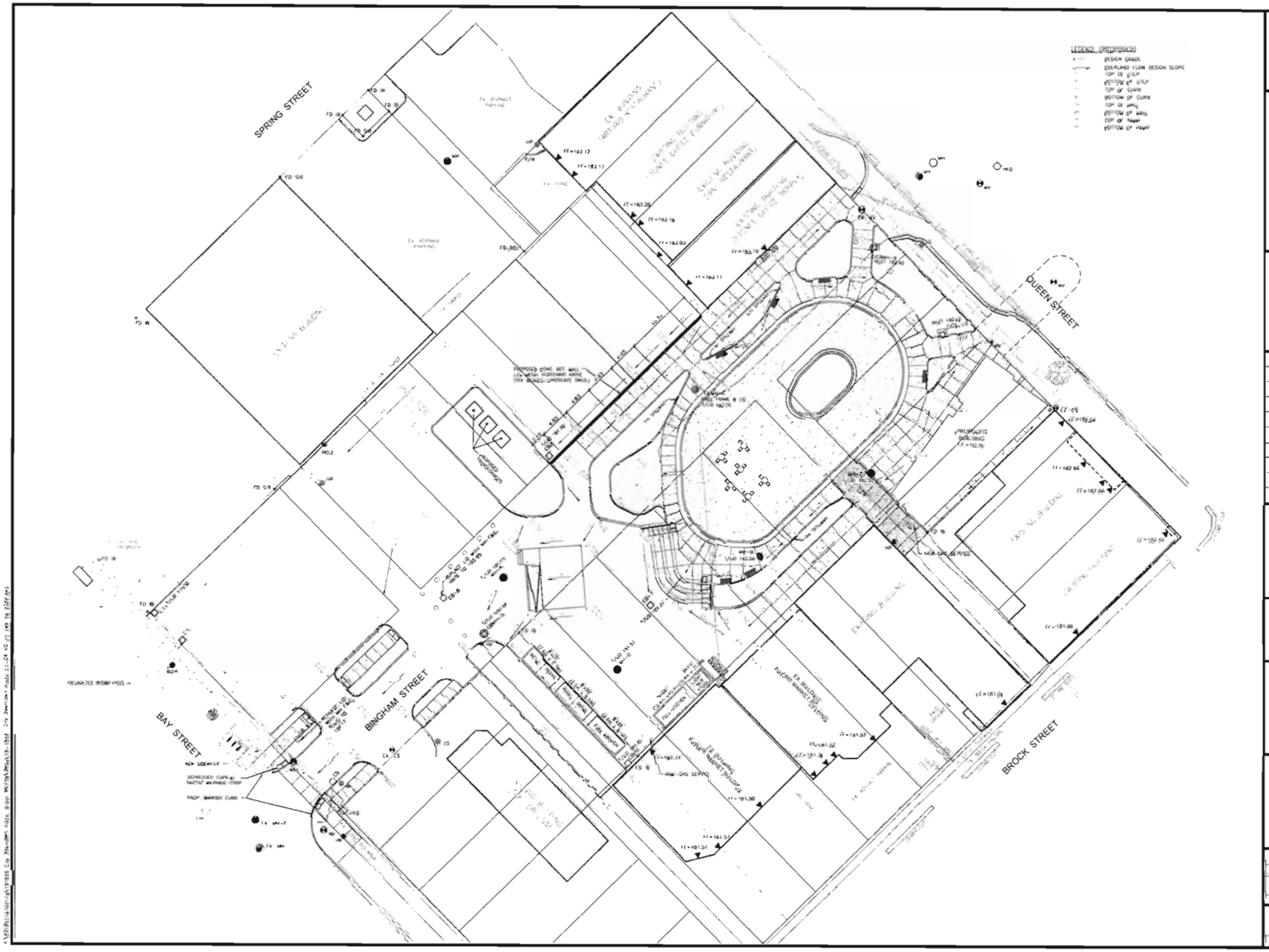
DRAWING TITLE:

SITE SERVICING PLAN

DRAWN	DESIGNED	CHECKED	APPROVED
KTN	JML	JML	JML

SCALE	DATE
1:250	FEB. 28, 2022

PROJECT No	REVISION	DRAWING
19-1866	0	C3



N

KEY PLAN

ENGINEER'S SEAL:

22-07-12	0	ISSUED FOR REVIEW	JS	JML
DATE	REV.	REVISION	BY	APP'D

OWNER:
BROOKMcILROY
161 SPADINA AVE.
TORONTO, ON

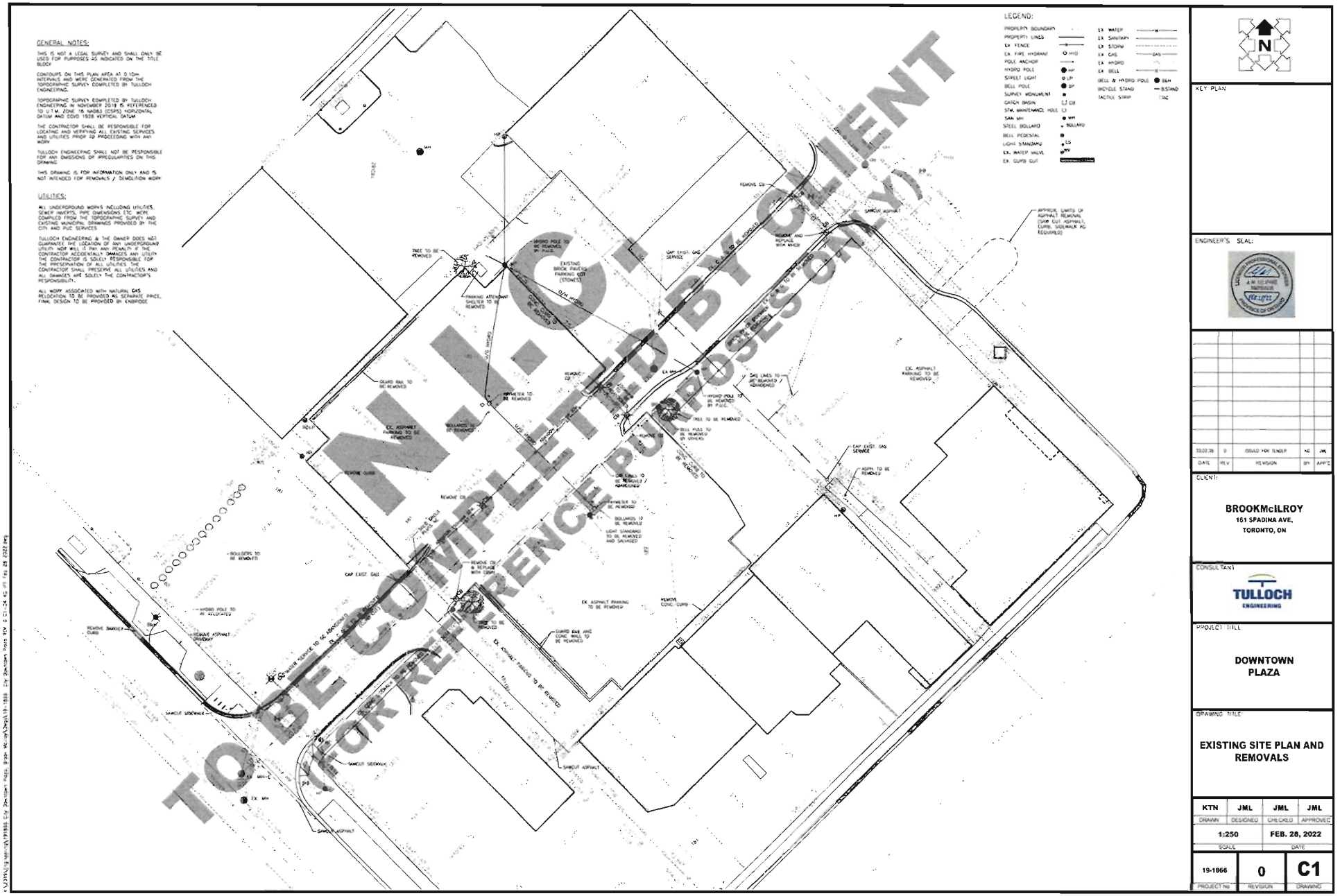
CONSULTANT:
TULLOCH ENGINEERING

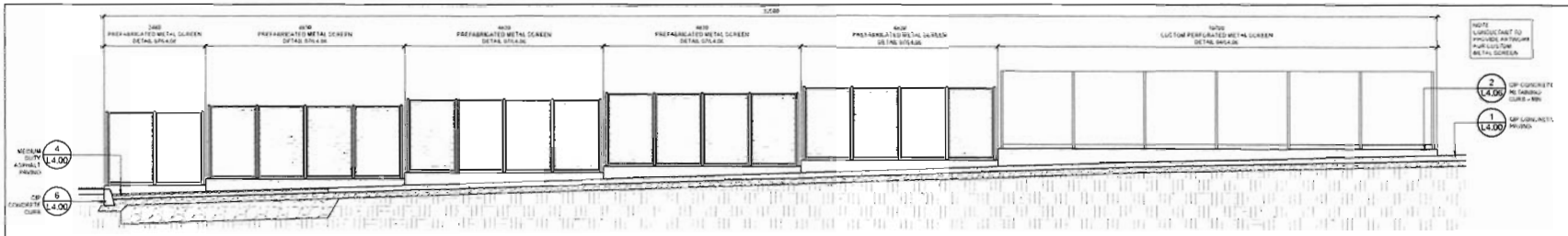
PROJECT TITLE:
DOWNTOWN PLAZA

DRAWING TITLE:
GRADING PLAN

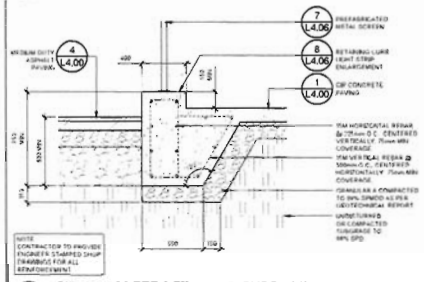
KTN	JML	JML	JML
DRAWN	DESIGNED	CHECKED	APPROVED
1:250		FEB. 28, 2022	
SCALE		DATE	

19-1866	0	C2
PROJECT No.	REVISION	DRAWING

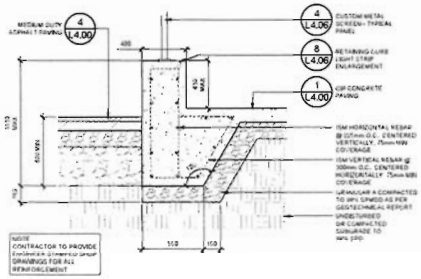

GENERAL NOTES:
THIS IS NOT A LEGAL SURVEY AND SHALL ONLY BE USED FOR PURPOSES AS INDICATED ON THE TITLE BLOCK
CONTOURS ON THIS PLAN AREA AT 0.10m INTERVALS AND WERE GENERATED FROM THE TOPOGRAPHIC SURVEY COMPLETED BY TULLOCH ENGINEERING.
TOPOGRAPHIC SURVEY COMPLETED BY TULLOCH ENGINEERING IN NOVEMBER 2019 IS REFERENCED TO U.T.M. ZONE 16 NAD83 (CSRS) HORIZONTAL DATUM AND CGVD 1928 VERTICAL DATUM
THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL EXISTING SERVICES AND UTILITIES PRIOR TO PROCEEDING WITH ANY WORK
TULLOCH ENGINEERING SHALL NOT BE RESPONSIBLE FOR ANY OMISSIONS OR IRREGULARITIES ON THIS DRAWING
THIS DRAWING IS FOR INFORMATION ONLY AND IS NOT INTENDED FOR REMOVALS / DEMOLITION WORK
UTILITIES:
ALL UNDERGROUND WORKS INCLUDING UTILITIES, SEWER INVERTS, PIPE DIMENSIONS ETC. WERE COMPILED FROM THE TOPOGRAPHIC SURVEY AND EXISTING MUNICIPAL DRAWINGS PROVIDED BY THE CITY AND PUC SERVICES
TULLOCH ENGINEERING & THE OWNER DOES NOT GUARANTEE THE LOCATION OF ANY UNDERGROUND UTILITY. NOR WILL IT PAY ANY PENALTY IF THE CONTRACTOR ACCIDENTALLY DAMAGES ANY UTILITY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PRESERVATION OF ALL UTILITIES THE CONTRACTOR SHALL PRESERVE ALL UTILITIES AND ALL DAMAGES ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
ALL WORK ASSOCIATED WITH NATURAL GAS RELOCATION TO BE PROVIDED AS SEPARATE PRICE. FINAL DESIGN TO BE PROVIDED BY ENBRIDGE
LEGEND:
PROPERTY BOUNDARY
PROPERTY LINES
EX. FENCE
EX. FIRE HYDRANT
POLE ANCHOR
HYDRO POLE
STREET LIGHT
BELL POLE
SURVEY MONUMENT
CATCH BASIN
STM. MAINTENANCE HOLE
SAN MH
STEEL BOLLARD
BELL PEDESTAL
LIGHTS STANDARD
EX. WATER VALVE
EX. CURB CUT
EX. WATER
EX. SANITARY
EX. STORM
EX. GAS
EX. HYDRO
EX. BELL
BELL & HYDRO POLE
BICYCLE STAND
TACTILE STRIP
N.I.C.
TO BE COMPLETED BY CLIENT
(FOR REFERENCE PURPOSES ONLY)
KEY PLAN
ENGINEER'S SEAL:
33.02.28 0 ISSUED FOR TENDER KE JML
DATE REV. REVISION BY APP'D
CLIENT:
BROOKMcILROY
161 SPADINA AVE.
TORONTO, ON
CONSULTANT
TULLOCH ENGINEERING
PROJECT TITLE
DOWNTOWN PLAZA
DRAWING TITLE
EXISTING SITE PLAN AND REMOVALS
KTN DRAWN
JML DESIGNED
JML CHECKED
JML APPROVED
1:250 SCALE
FEB. 28, 2022 DATE
19-1866 PROJECT No
0 REVISION
C1 DRAWING



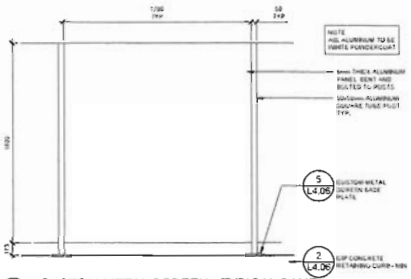
1 METAL SCREEN SECTION
1:50



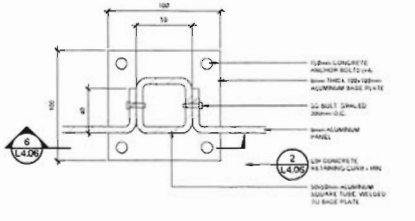
2 CIP CONCRETE RETAINING CURB - MIN
1:20



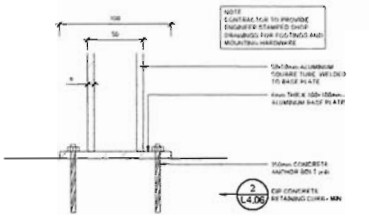
3 CIP CONCRETE RETAINING CURB - MAX
1:20



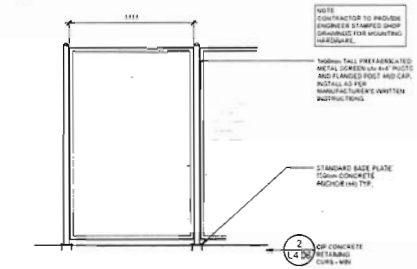
4 CUSTOM METAL SCREEN - TYPICAL PANEL
1:20



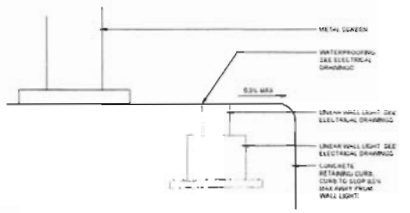
5 CUSTOM METAL SCREEN BASE PLATE
1:2



6 CUSTOM METAL SCREEN MOUNTING ENLARGEMENT
1:2



7 PREFABRICATED METAL SCREEN
1:20



8 RETAINING CURB LIGHT STRIP ENLARGEMENT
1:2

DRAWING ISSUE RECORD

NO.	YY-MM-DD	ISSUED FOR	BY
3	22-02-25	ISSUED FOR TENDER	PDF
2	21-09-10	ISSUED FOR PRICING	PDF
1	21-04-23	ISSUED FOR SPC REVIEW	PDF
NO.	YY-MM-DD	DRAWING ISSUE RECORD	BY/ISSUE

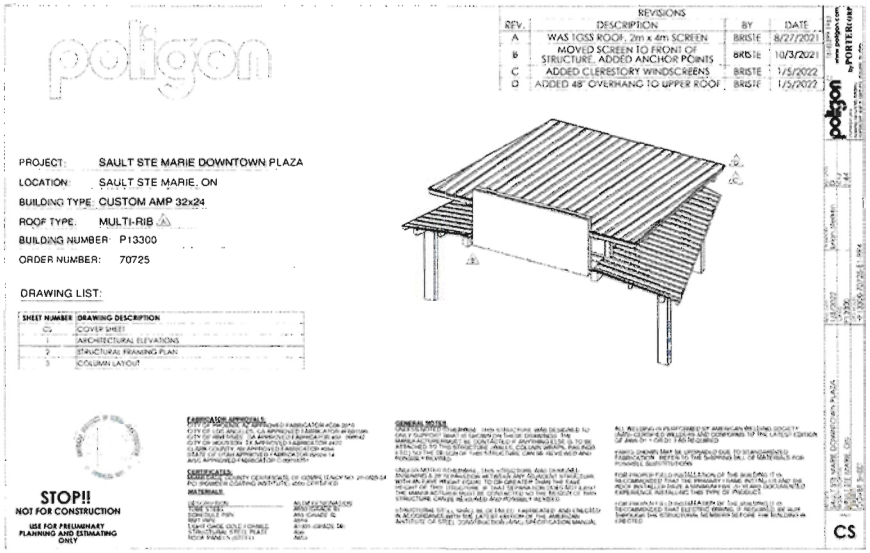
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

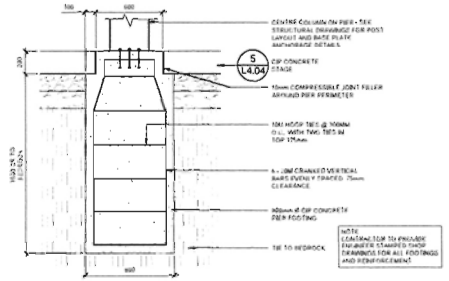
BrookMcIlroy/

SHEET TITLE
LANDSCAPE DETAILS
METAL SCREEN

PROJECT NO.
19-076
DESIGNED
TC
DRAWN
LH
DATE
2022-02-25
SCALE
AS SHOWN
SHEET NO.
L4.06



1 STAGE STRUCTURE



2 STAGE STRUCTURE CONCRETE FOOTING

DRAWING ISSUE RECORD

NO.	DATE	ISSUED FOR	BY
3	2022-02-25	ISSUED FOR TENDER	PDF
2	21-09-13	ISSUED FOR PRICING	PDF
1	21-04-23	ISSUED FOR 50% REVIEW	PDF
NO.	DATE	DRAWING ISSUE RECORD	BY/CHK

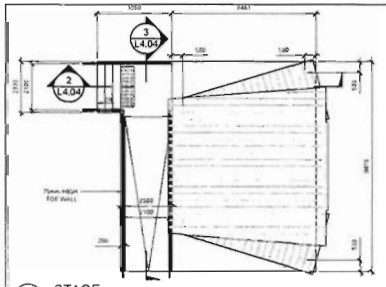
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

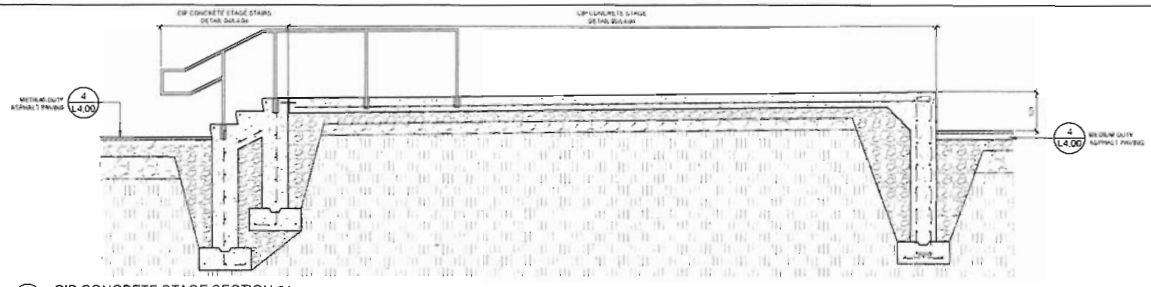
BrookMcIlroy

SHEET TITLE
LANDSCAPE DETAILS
STAGE STRUCTURE

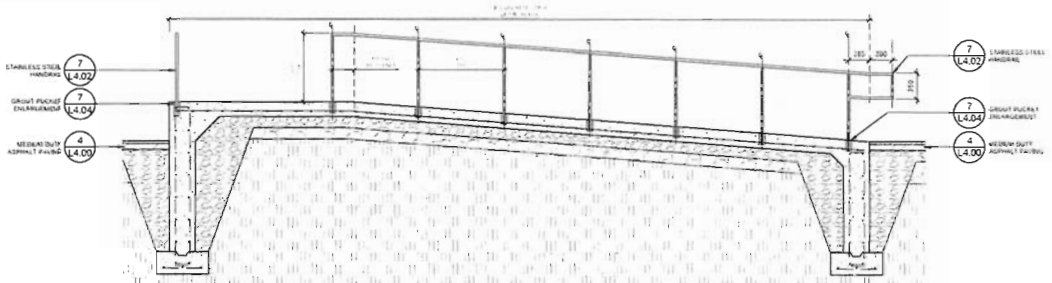
PROJECT NO.
19-076
DESIGNED
TC
DRAWN
LM
DATE
2022-02-25
SCALE
AS SHOWN
SHEET NO.
L4.05



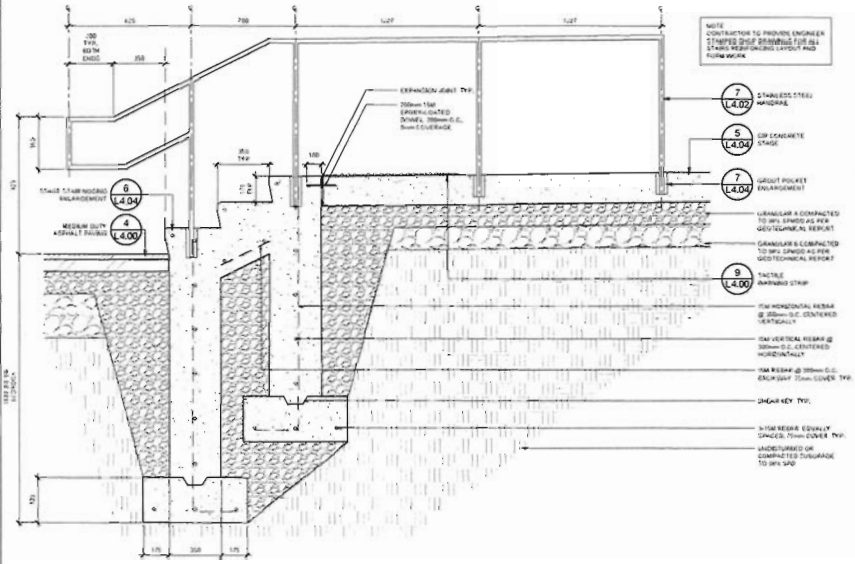
1 STAGE
1:100



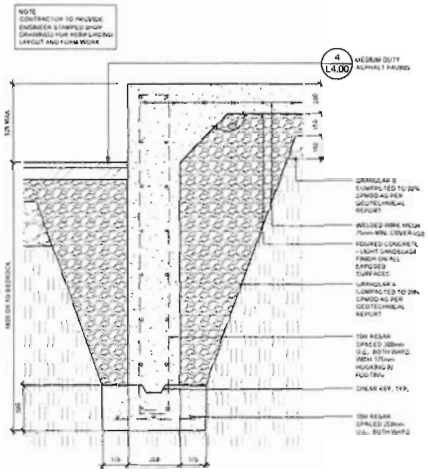
2 CIP CONCRETE STAGE SECTION 01
1:50



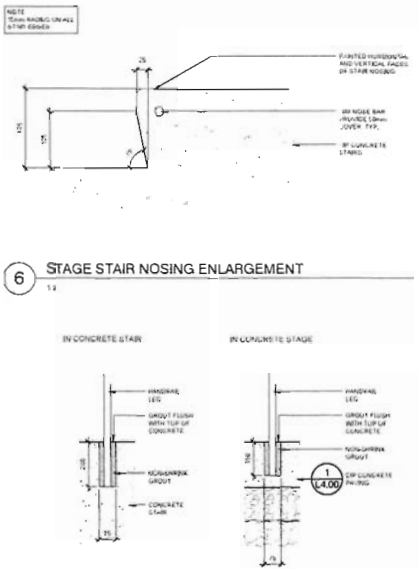
3 CIP CONCRETE STAGE SECTION 02
1:50



4 CIP CONCRETE STAGE STAIRS
1:15



5 CIP CONCRETE STAGE
1:10



6 STAGE STAIR NOSING ENLARGEMENT
1:2

7 GROUT POCKET ENLARGEMENT
1:10

NO.	YY-MM-DD	DRAWING ISSUE RECORD	BY
3	21-05-17	ISSUED FOR TENDER	PDP
2	21-03-15	ISSUED FOR PRICING	PDP
1	21-02-25	ISSUED FOR SDP REVIEW	PDP

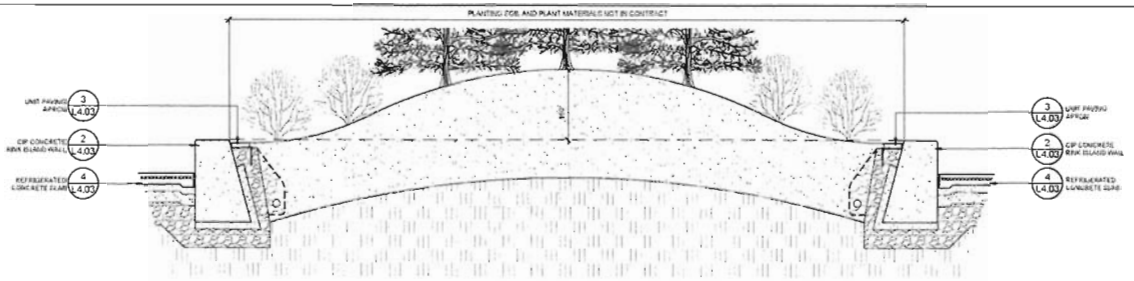
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

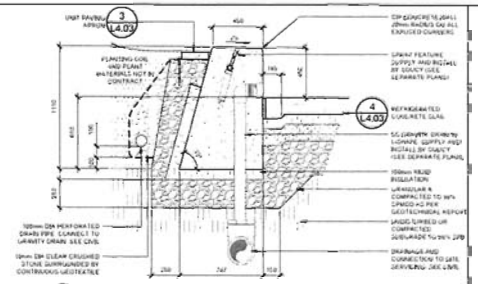
BrookMcIlroy

SHEET TITLE
LANDSCAPE DETAILS
STAGE

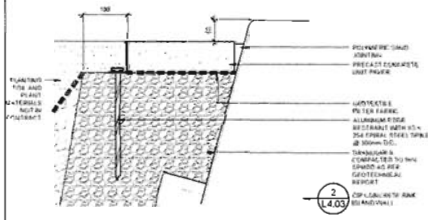
PROJECT NO.
19-076
DESIGNED
TC
DRAWN
LH
DATE
2021-02-25
SCALE
AS SHOWN
SHEET NO.
L4.04



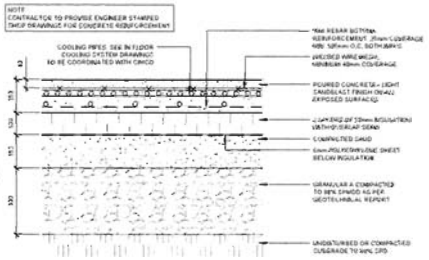
1 SKATING RINK PLANTER SECTION



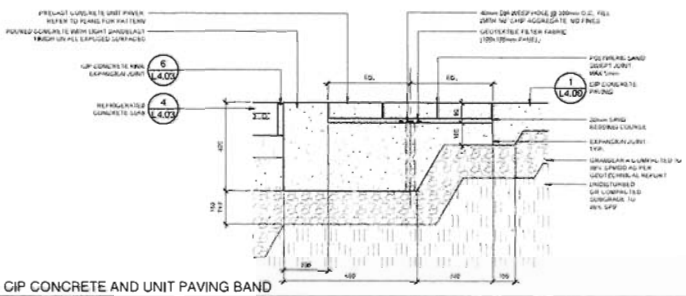
2 CIP CONCRETE RINK ISLAND WALL



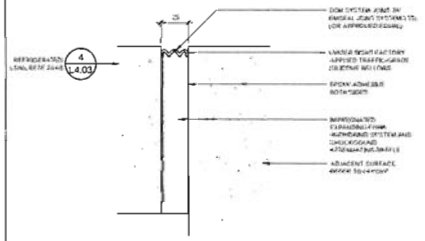
3 UNIT PAVING APRON



4 REFRIGERATED CONCRETE SLAB



5 CIP CONCRETE AND UNIT PAVING BAND



6 CIP CONCRETE RINK EXPANSION JOINT

3	2022-02-25	ISSUED FOR TENDER	PDF
2	21-09-10	ISSUED FOR PRICING	PDF
1	21-06-25	ISSUED FOR SPC REVIEW	PDF
NO.	YY-MM-DD	DRAWING ISSUE RECORD	ISSUE

SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT

CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE

LANDSCAPE DETAILS
SKATING RINK

PROJECT NO.
19-076

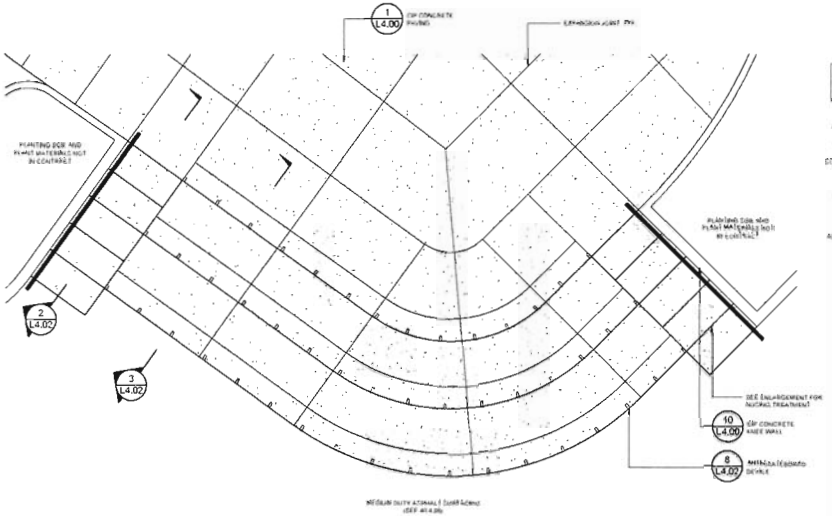
DESIGNED
TC

DRAWN
LH

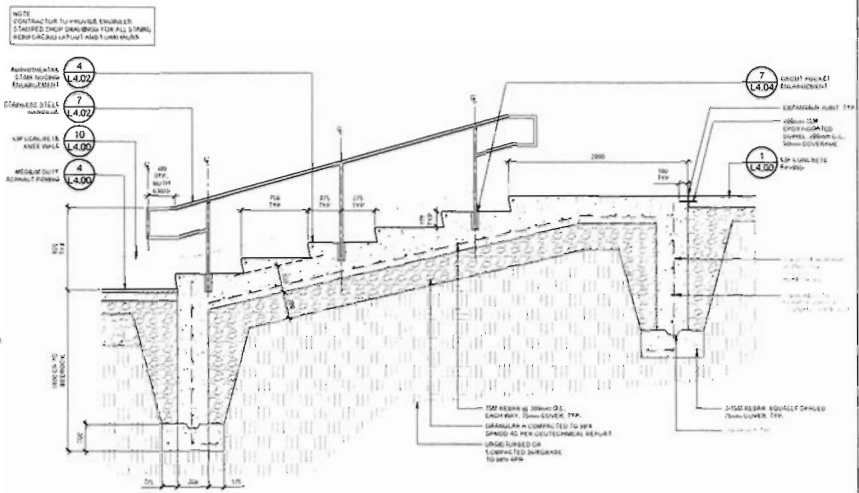
DATE
2022-02-25

SCALE
AS SHOWN

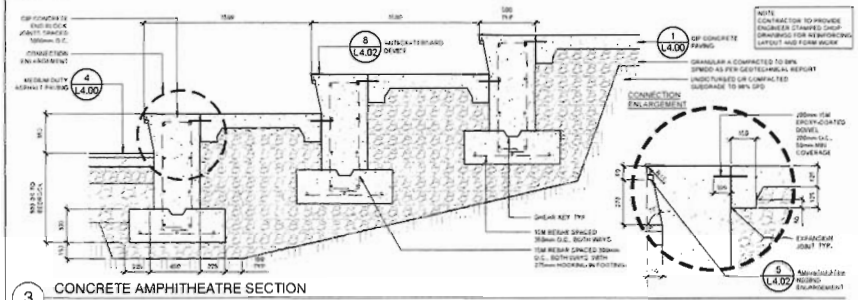
SHEET NO.
L4.03



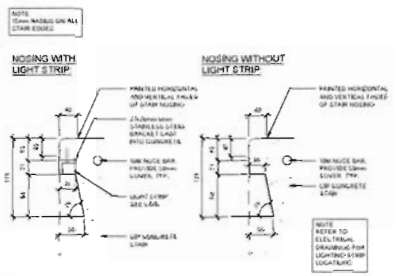
1 AMPHITHEATRE ENLARGEMENT



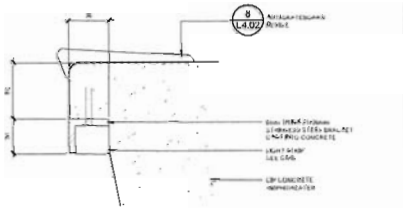
2 CIP CONCRETE AMPHITHEATRE STAIRS



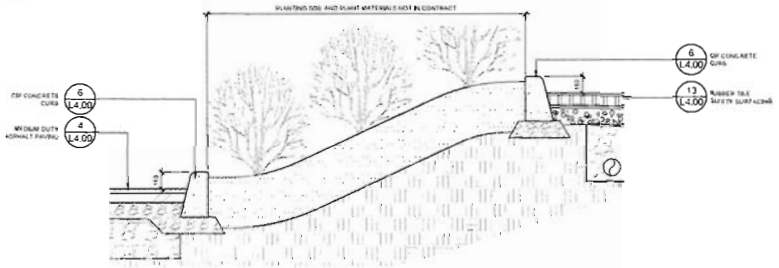
3 CONCRETE AMPHITHEATRE SECTION



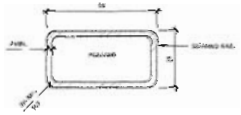
4 AMPHITHEATRE STAIR NOSING ENLARGEMENT



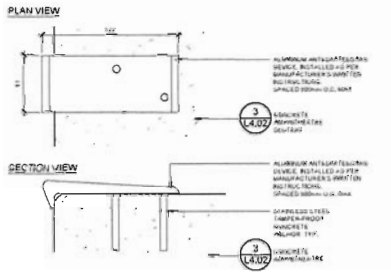
5 AMPHITHEATER NOSING ENLARGEMENT



6 PLANTER SECTION



7 STAINLESS STEEL HANDRAIL



8 ANTI-SKATEBOARD DEVICE

DRAWING ISSUE RECORD			
2	[illegible]	ISSUED FOR TENDER	PDF
1	21-Mar-25	ISSUED FOR PRICING	PDF
0	21-Feb-25	ISSUED FOR 50% REVIEW	PDF
No.	[illegible]	DRAWING ISSUE RECORD	REMK

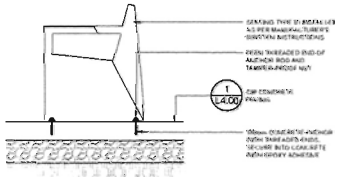
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

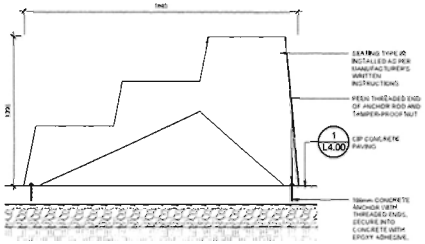
BrookMcIlroy

SHEET TITLE
LANDSCAPE DETAILS
AMPHITHEATRE

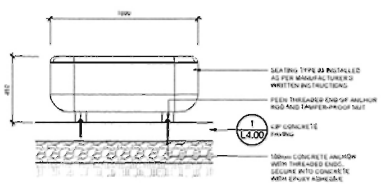
PROJECT NO.
19-07b
DESIGNED
TC
DRAWN
LH
DATE
2022-02-25
SCALE
AS SHOWN
SHEET NO.
L4.02



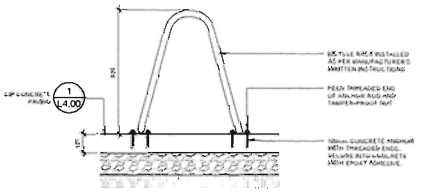
1 SEATING TYPE 01
1:15



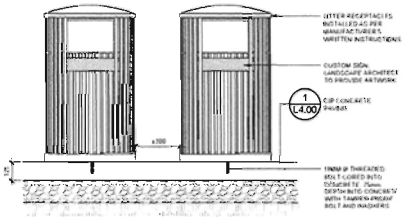
2 SEATING TYPE 02
1:15



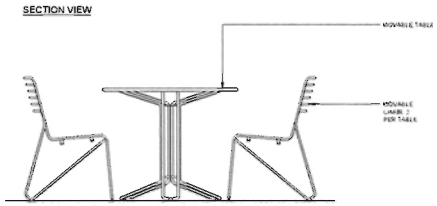
3 SEATING TYPE 03
1:15



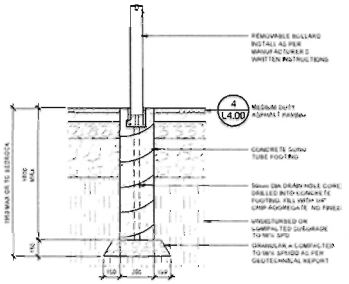
4 BICYCLE RACK
1:15



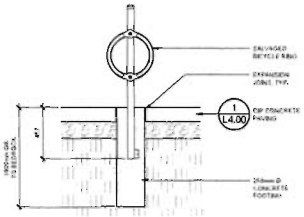
5 LITTER AND RECYCLING RECEPTACLES
1:15



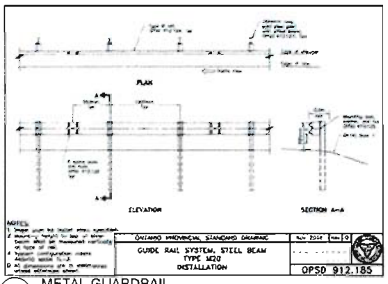
6 MOVABLE TABLE AND CHAIRS
1:15

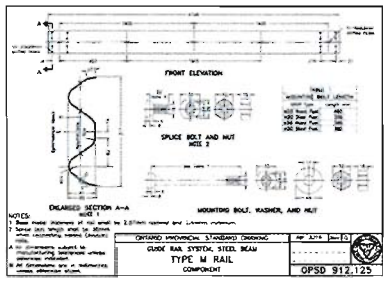


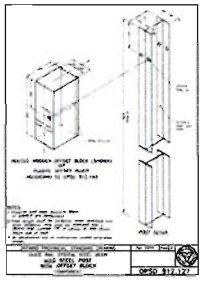
7 REMOVABLE BOLLARD
1:20



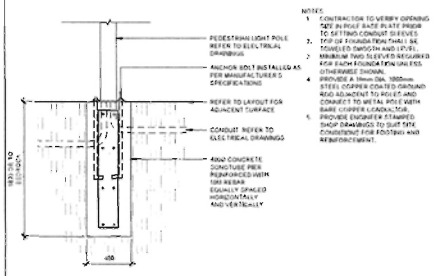
8 SALVAGED BICYCLE RING
1:20



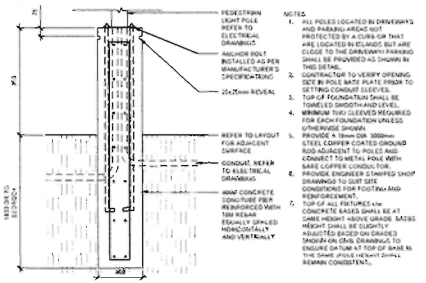




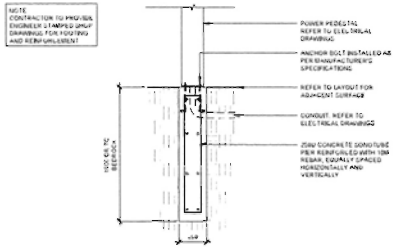
9 METAL GUARDRAIL
1:20



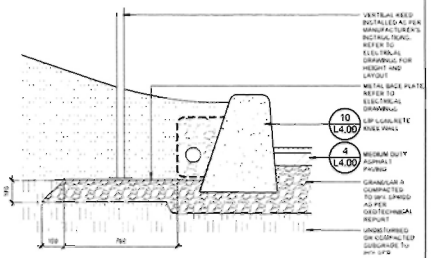
10 PEDESTRIAN LIGHT STANDARD FOOTING
1:20



11 RAISED PEDESTRIAN LIGHT STANDARD FOOTING
1:20



12 POWER PEDESTAL FOOTING
1:20



13 VERTICAL REED
1:15

DRAWING/ISSUE RECORD

NO.	BY	MM/DD/YY	DRAWING ISSUE RECORD	MEDIA
3	JH/MH	21-07-12	ISSUED FOR TENDER	PDF
2	JH/MH	21-06-11	ISSUED FOR PRICING	PDF
1	JH/MH	21-04-26	ISSUED FOR 50% REVIEW	PDF

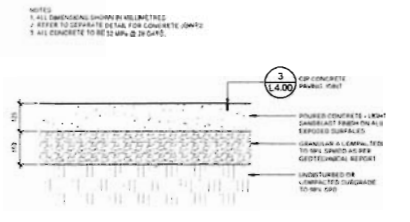
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

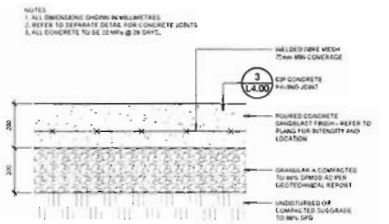
BrookMcIlroy

SHEET TITLE
LANDSCAPE DETAILS
FURNITURE

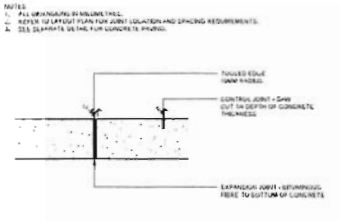
PROJECT NO.
19-078
DESIGNER
TC
DRAWN
LH
DATE
2022-02-25
SCALE
AS SHOWN
SHEET NO.
L4.01



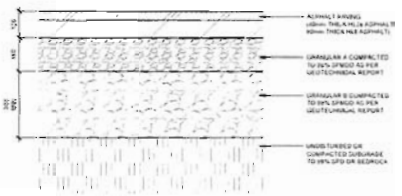
1 CIP CONCRETE PAVING
1:10



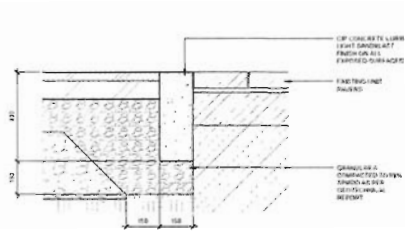
2 HEAVY DUTY CIP CONCRETE PAVING
1:10



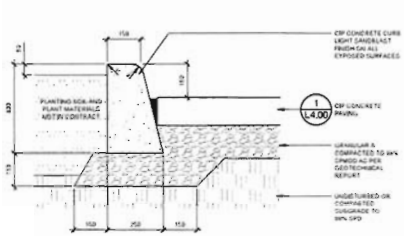
3 CIP CONCRETE PAVING JOINT
1:10



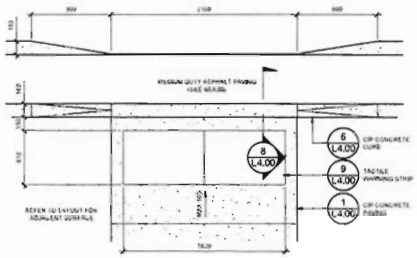
4 MEDIUM DUTY ASPHALT PAVING
1:10



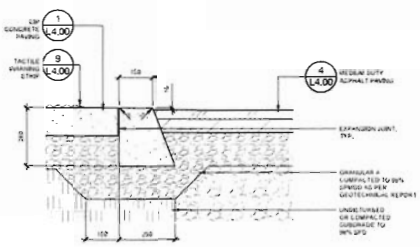
5 FLUSH CIP CONCRETE CURB
1:10



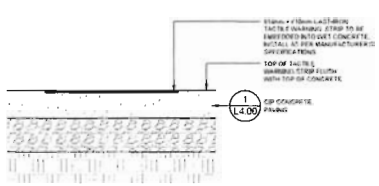
6 CIP CONCRETE CURB
1:10



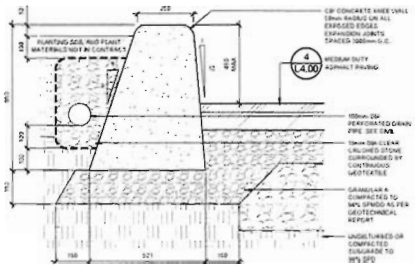
7 CIP DEPRESSED CURB
1:20



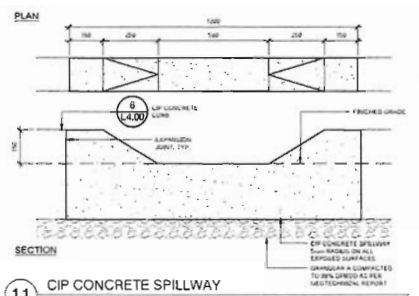
8 CIP DEPRESSED CURB SECTION
1:10



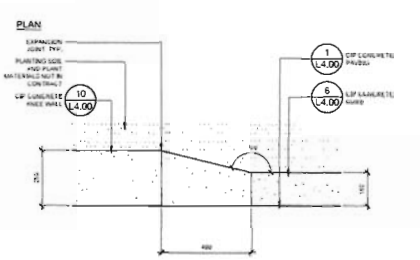
9 TACTILE WARNING STRIP
1:10



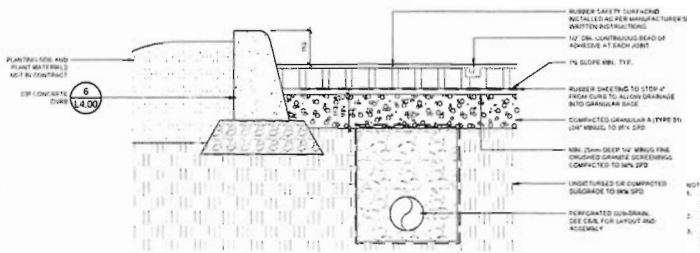
10 CIP CONCRETE KNEE WALL
1:10



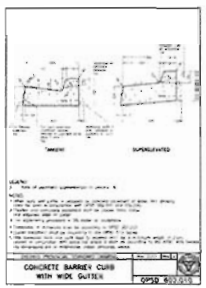
11 CIP CONCRETE SPILLWAY
1:10



12 CIP CONCRETE CURB TRANSITION
1:10



13 RUBBER TILE SAFETY SURFACING
1:10



14 CIP CONCRETE CURB AND GUTTER
1:10

NO.	BY	DRAWING ISSUE RECORD	MMDD
3	JH	ISSUED FOR TENDER	PDF
2	JH	ISSUED FOR PRICING	PDF
1	JH	ISSUED FOR 50% REVIEW	PDF

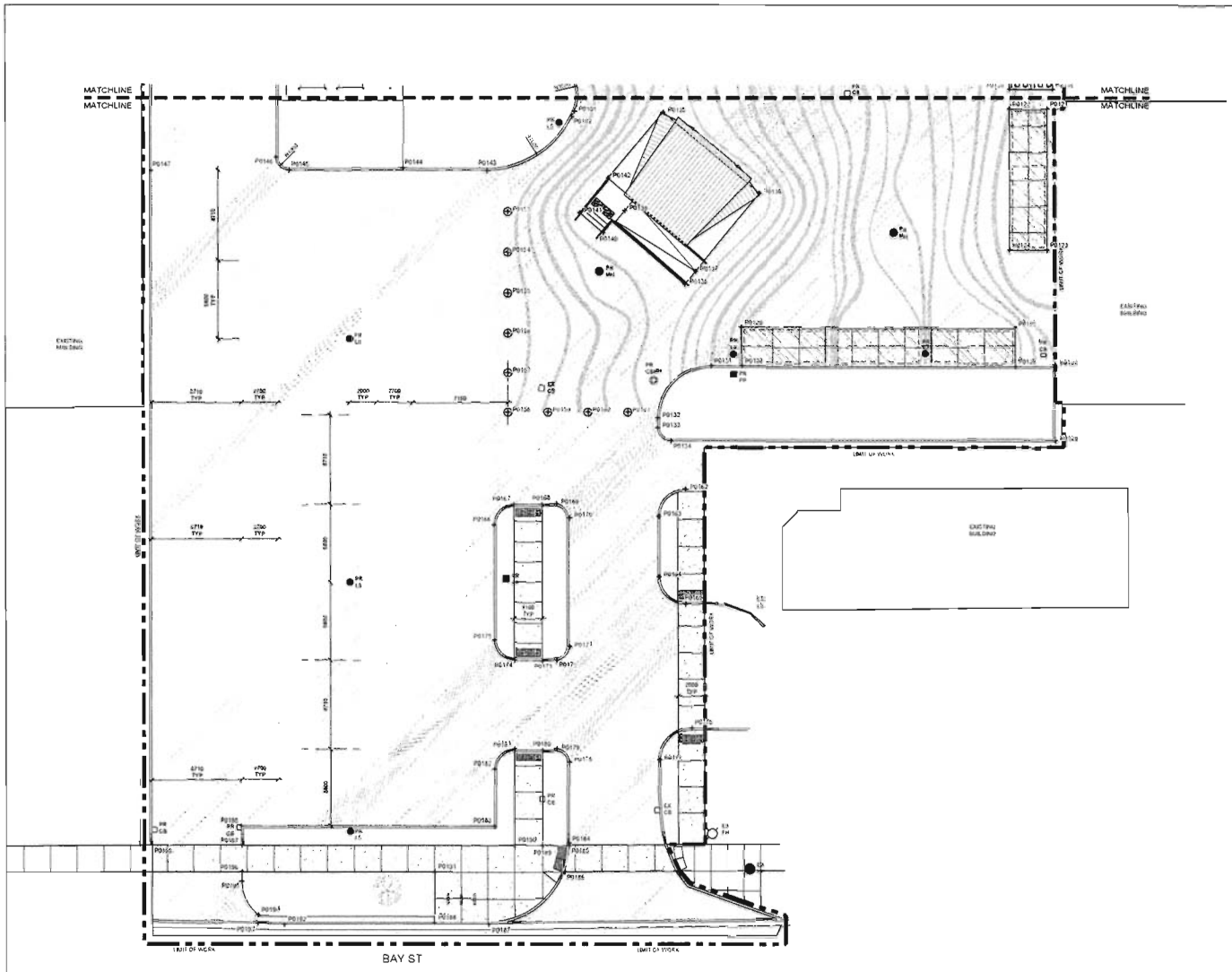
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
LANDSCAPE DETAILS
PAVING

PROJECT NO.
19-076
DESIGNED
TC
DRAWN
LH
DATE
2022-02-25
SCALE
AS SHOWN
SHEET NO.
L4.00



LEGEND

SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CITY OF SAULT STE. MARIE

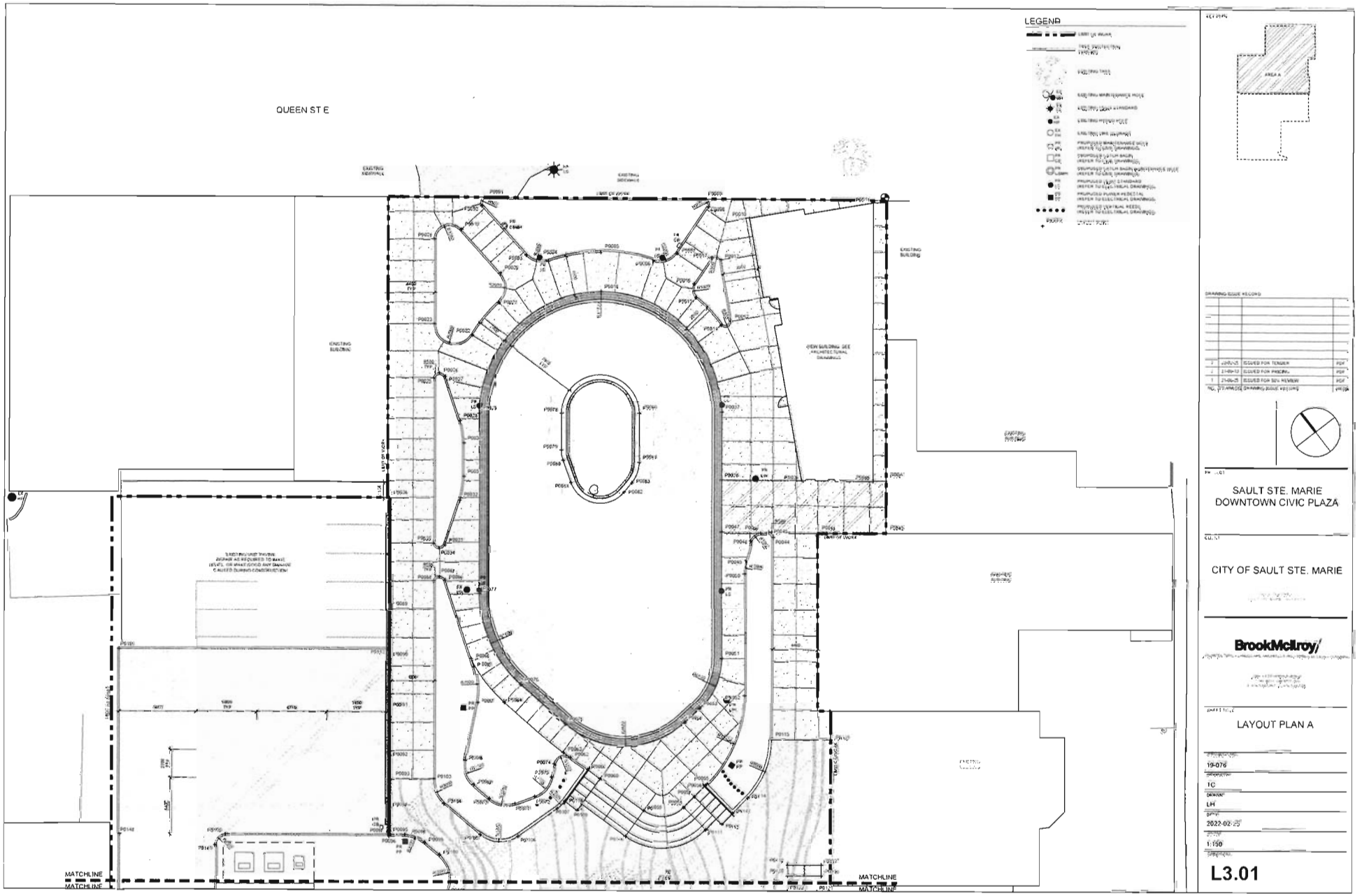
BrookMcIlroy

LAYOUT PLAN B

19-076

1:150

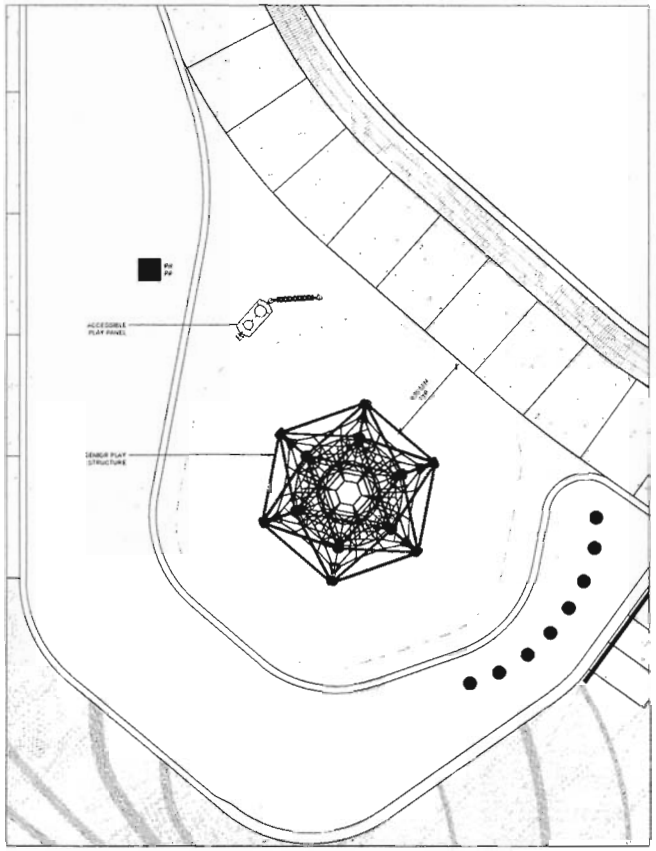
L3.02


QUEEN ST E
LEGEND
MATCHLINE
MATCHLINE
MATCHLINE
MATCHLINE
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
LAYOUT PLAN A
19-076
TC
LH
2022-02-25
1:150
L3.01

LAYOUT POINT TABLE

POINT	EASTING	NORTHING	DESCRIPTION
P1001	7047351.157	5154137.694	EDGE OF CONCRETE CURB START OF RADIUS
P1002	7047358.479	5154132.375	EDGE OF CONCRETE CURB START OF RADIUS
P1003	7047368.068	5154131.186	EDGE OF CONCRETE CURB START OF RADIUS
P1004	7047395.163	5154129.091	EDGE OF CONCRETE CURB START OF RADIUS
P1005	7047439.124	5154126.354	EDGE OF CONCRETE CURB CENTER OF RADIUS
P1006	7047361.257	5154121.621	EDGE OF CONCRETE CURB START OF RADIUS
P1007	7047358.420	5154130.789	EDGE OF CONCRETE CURB START OF RADIUS
P1008	7047393.775	5154121.662	EDGE OF CONCRETE CURB START OF RADIUS
P1009	7048000.186	5154122.589	EDGE OF CONCRETE CURB START OF RADIUS
P1010	7048061.779	5154118.097	CORNER OF PROPOSED BUILDING
P1011	7048111.181	5154115.134	CORNER OF PROPOSED BUILDING
P1012	7047961.954	5154117.229	EDGE OF CONCRETE CURB START OF RADIUS
P1013	7047133.147	5154111.150	EDGE OF CONCRETE CURB START OF RADIUS
P1014	7047247.122	5154112.197	EDGE OF CONCRETE CURB START OF RADIUS
P1015	7047353.002	5154116.625	EDGE OF CONCRETE CURB START OF RADIUS
P1016	7047371.921	5154117.436	EDGE OF CONCRETE CURB START OF RADIUS
P1017	7047396.260	5154118.049	EDGE OF CONCRETE CURB START OF RADIUS
P1018	7047361.591	5154113.412	EDGE OF UNIT PAVING BAND CENTER OF RADIUS
P1019	7047361.467	5154117.214	EDGE OF CONCRETE CURB START OF RADIUS
P1020	7047351.999	5154116.576	EDGE OF CONCRETE CURB START OF RADIUS
P1021	7047279.947	5154109.788	EDGE OF CONCRETE CURB START OF RADIUS
P1022	7047274.975	5154114.350	EDGE OF CONCRETE CURB START OF RADIUS
P1023	7047277.127	5154122.734	EDGE OF CONCRETE CURB START OF RADIUS
P1024	7047278.953	5154130.397	EDGE OF CONCRETE CURB START OF RADIUS
P1025	7047269.408	5154129.930	EDGE OF CONCRETE CURB START OF RADIUS
P1026	7047279.140	5154139.041	EDGE OF CONCRETE CURB START OF RADIUS
P1027	7047279.295	5154130.825	EDGE OF CONCRETE CURB START OF RADIUS
P1028	7047282.231	5154134.417	EDGE OF CONCRETE CURB START OF RADIUS
P1029	7047270.947	5154129.041	EDGE OF CONCRETE CURB START OF RADIUS
P1030	7047284.196	5154132.411	EDGE OF CONCRETE CURB START OF RADIUS
P1031	7047284.577	5154139.256	EDGE OF CONCRETE CURB START OF RADIUS
P1032	7047282.760	5154119.845	EDGE OF CONCRETE CURB START OF RADIUS
P1033	7047279.094	5154112.196	EDGE OF CONCRETE CURB START OF RADIUS
P1034	7047281.958	5154117.241	EDGE OF CONCRETE CURB START OF RADIUS
P1035	7047284.025	5154119.684	EDGE OF CONCRETE CURB START OF RADIUS
P1036	7047282.166	5154118.011	EDGE OF CONCRETE TIE TURNING CURB CENTERLINE
P1037	7047284.415	5154116.067	EDGE OF UNIT PAVING BAND START OF RADIUS
P1038	7047281.600	5154112.364	CORNER OF HEAVY DUTY CONCRETE PAVING
P1039	7047277.233	5154108.497	CORNER OF PROPOSED BUILDING
P1040	7047279.042	5154097.584	CORNER OF PROPOSED BUILDING
P1041	7047282.906	5154093.948	CORNER OF HEAVY DUT CONCRETE PAVING
P1042	7047284.138	5154087.425	CORNER OF HEAVY DUTY CONCRETE PAVING
P1043	7047268.697	5154093.139	CORNER OF EXISTING BUILDING
P1044	7047281.261	5154084.361	EDGE OF CONCRETE CURB START OF RADIUS
P1045	7047281.680	5154078.680	EDGE OF CONCRETE CURB START OF RADIUS
P1046	7047280.850	5154076.392	EDGE OF CONCRETE CURB START OF RADIUS
P1047	7047276.166	5154086.032	CORNER OF HEAVY DUTY CONCRETE PAVING
P1048	7047279.053	5154098.229	EDGE OF CONCRETE CURB START OF RADIUS
P1049	7047277.304	5154096.296	EDGE OF CONCRETE CURB START OF RADIUS
P1050	7047275.256	5154088.474	EDGE OF CONCRETE CURB START OF RADIUS
P1051	7047269.870	5154088.342	EDGE OF UNIT PAVING BAND START OF RADIUS
P1052	7047260.468	5154088.192	EDGE OF CONCRETE CURB START OF RADIUS
P1053	7047264.577	5154080.674	EDGE OF UNIT PAVING BAND START OF RADIUS
P1054	7047267.591	5154080.063	EDGE OF UNIT PAVING BAND START OF RADIUS
P1055	7047278.964	5154082.987	EDGE OF CONCRETE CURB START OF RADIUS
P1056	7047291.741	5154082.080	CORNER OF CONCRETE CURB
P1057	7047296.183	5154086.481	CORNER OF AMPHITHEATER START
P1058	7047296.400	5154080.915	EDGE OF AMPHITHEATER START
P1059	7047291.080	5154078.475	EDGE OF AMPHITHEATER START
P1060	7047263.695	5154080.147	CORNER OF AMPHITHEATER START
P1061	7047292.180	5154076.126	CORNER OF CONCRETE CURB
P1062	7047275.150	5154074.176	EDGE OF CONCRETE CURB START OF RADIUS
P1063	7047252.419	5154074.397	EDGE OF RUBBER SURFACING START OF RADIUS
P1064	7047251.882	5154072.295	EDGE OF RUBBER SURFACING START OF RADIUS
P1065	7047252.267	5154066.882	EDGE OF CONCRETE CURB START OF RADIUS
P1066	7047252.427	5154067.641	EDGE OF CONCRETE PAVING START OF RADIUS
P1067	7047249.660	5154061.275	EDGE OF CONCRETE CURB START OF RADIUS
P1068	7047245.242	5154061.330	EDGE OF CONCRETE CURB START OF RADIUS
P1069	7047244.126	5154060.867	EDGE OF CONCRETE CURB START OF RADIUS
P1070	7047244.284	5154058.196	EDGE OF CONCRETE CURB START OF RADIUS
P1071	7047245.629	5154058.256	EDGE OF CONCRETE CURB START OF RADIUS
P1072	7047247.437	5154055.394	EDGE OF CONCRETE CURB START OF RADIUS
P1073	7047251.933	5154058.330	EDGE OF CONCRETE CURB START OF RADIUS
P1074	7047251.953	5154054.307	EDGE OF CONCRETE CURB START OF RADIUS
P1075	7047254.345	5154056.706	EDGE OF UNIT PAVING BAND START OF RADIUS
P1076	7047254.079	5154058.515	EDGE OF UNIT PAVING BAND START OF RADIUS
P1077	7047251.905	5154061.417	EDGE OF UNIT PAVING BAND START OF RADIUS
P1078	7047253.597	5154112.917	EDGE OF RAM ISLAND WALL START OF RADIUS
P1079	7047253.860	5154115.646	EDGE OF RAM ISLAND WALL START OF RADIUS
P1080	7047252.472	5154118.021	EDGE OF RAM ISLAND WALL START OF RADIUS
P1081	7047251.679	5154121.049	EDGE OF RAM ISLAND WALL START OF RADIUS
P1082	7047254.280	5154130.256	EDGE OF RAM ISLAND WALL START OF RADIUS
P1083	7047257.551	5154130.358	EDGE OF RAM ISLAND WALL START OF RADIUS
P1084	7047257.953	5154128.225	EDGE OF RAM ISLAND WALL START OF RADIUS
P1085	7047260.365	5154122.545	EDGE OF RAM ISLAND WALL START OF RADIUS
P1086	7047258.177	5154114.735	EDGE OF CONCRETE CURB START OF RADIUS
P1087	7047261.134	5154115.256	EDGE OF CONCRETE CURB START OF RADIUS
P1088	7047261.771	5154111.421	EDGE OF CONCRETE CURB START OF RADIUS
P1089	7047260.509	5154110.545	EDGE OF CONCRETE RETAINING CURB AT STEP DOWN CENTERLINE
P1090	7047247.043	5154111.171	EDGE OF CONCRETE RETAINING CURB AT STEP DOWN CENTERLINE
P1091	7047243.569	5154111.081	EDGE OF CONCRETE RETAINING CURB AT STEP DOWN CENTERLINE
P1092	7047247.131	5154116.423	EDGE OF CONCRETE RETAINING CURB AT STEP DOWN CENTERLINE
P1093	7047261.878	5154118.387	CORNER OF CONCRETE PAVING
P1094	7047263.673	5154120.050	EDGE OF CONCRETE RETAINING CURB AT STEP DOWN CENTERLINE
P1095	7047276.144	5154122.252	CORNER OF CONCRETE CURB
P1096	7047266.997	5154118.324	EDGE OF CONCRETE RETAINING CURB CENTERLINE
P1097	7047264.965	5154118.527	CORNER OF CONCRETE CURB
P1098	7047263.962	5154119.382	EDGE OF CONCRETE CURB START OF RADIUS
P1099	7047262.450	5154120.474	EDGE OF CONCRETE CURB START OF RADIUS
P1100	7047261.951	5154121.624	EDGE OF CONCRETE CURB START OF RADIUS

POINT	EASTING	NORTHING	DESCRIPTION
P1101	7047265.905	5154091.945	EDGE OF CONCRETE CURB START OF RADIUS
P1102	7047264.479	5154092.370	EDGE OF CONCRETE CURB START OF RADIUS
P1103	7047263.232	5154093.322	EDGE OF CONCRETE CURB START OF RADIUS
P1104	7047261.625	5154099.730	EDGE OF CONCRETE CURB START OF RADIUS
P1105	7047261.374	5154100.575	EDGE OF CONCRETE KNEE WALL START OF RADIUS
P1106	7047261.651	5154102.203	EDGE OF CONCRETE KNEE WALL START OF RADIUS
P1107	7047261.860	5154103.597	EDGE OF CONCRETE KNEE WALL START OF RADIUS
P1108	7047261.170	5154105.509	EDGE OF CONCRETE KNEE WALL START OF RADIUS
P1109	7047260.205	5154108.067	CORNER OF AMPHITHEATER STEPS
P1110	7047258.857	5154065.040	EDGE OF AMPHITHEATER START OF RADIUS
P1111	7047256.769	5154074.953	EDGE OF AMPHITHEATER START OF RADIUS
P1112	7047252.203	5154073.914	CORNER OF AMPHITHEATER STEPS
P1113	7047257.703	5154073.114	CORNER OF CONCRETE KNEE WALL
P1114	7047253.263	5154071.116	EDGE OF CONCRETE KNEE WALL START OF RADIUS
P1115	7047247.853	5154069.410	CORNER OF CONCRETE PAVING
P1116	7047247.557	5154067.103	CORNER OF CONCRETE PAVING
P1117	7047247.701	5154065.566	CORNER OF CONCRETE PAD
P1118	7047247.481	5154064.674	CORNER OF CONCRETE PAD
P1119	7047247.962	5154061.961	CORNER OF CONCRETE PAD
P1120	7047251.102	5154061.258	CORNER OF CONCRETE PAD
P1121	7047247.909	5154060.743	CORNER OF CONCRETE PAD
P1122	7047247.540	5154058.453	CORNER OF CONCRETE PAD
P1123	7047250.904	5154057.743	CORNER OF CONCRETE PAD
P1124	7047247.771	5154055.518	CORNER OF CONCRETE PAD
P1125	7047247.521	5154054.531	CORNER OF CONCRETE PAD
P1126	7047246.829	5154054.102	CORNER OF CONCRETE CURB
P1127	7047247.225	5154052.040	CORNER OF CONCRETE CURB
P1128	7047247.330	5154051.142	CORNER OF CONCRETE PAD
P1129	7047247.330	5154051.142	CORNER OF CONCRETE PAD
P1130	7047247.706	5154051.241	CORNER OF CONCRETE PAD
P1131	7047253.660	5154051.005	EDGE OF CONCRETE CURB START OF RADIUS
P1132	7047253.824	5154049.580	EDGE OF CONCRETE CURB START OF RADIUS
P1133	7047252.462	5154047.940	EDGE OF CONCRETE CURB START OF RADIUS
P1134	7047247.648	5154047.118	EDGE OF CONCRETE CURB START OF RADIUS
P1135	7047239.660	5154050.726	CORNER OF CONCRETE STAIR
P1136	7047247.301	5154047.257	CORNER OF CONCRETE STAIR
P1137	7047247.658	5154045.725	EDGE OF CONCRETE RAMP CENTERLINE
P1138	7047239.644	5154049.635	CORNER OF CONCRETE RAMP
P1139	7047247.301	5154045.658	EDGE OF CONCRETE RAMP CENTERLINE
P1140	7047247.896	5154045.604	CORNER OF CONCRETE STAIR STAIRS
P1141	7047239.837	5154047.879	CORNER OF CONCRETE STAIR STAIRS
P1142	7047247.247	5154045.054	EDGE OF CONCRETE STAIR
P1143	7047247.326	5154044.547	EDGE OF CONCRETE CURB START OF RADIUS
P1144	7047252.618	5154040.763	EDGE OF PLANTING BED
P1145	7047236.858	5154039.750	EDGE OF CONCRETE CURB START OF RADIUS
P1146	7047231.805	5154037.572	EDGE OF CONCRETE CURB START OF RADIUS
P1147	7047239.790	5154031.948	EDGE OF CONCRETE CURB
P1148	7047246.822	5154029.004	EDGE OF CONCRETE CURB
P1149	7047247.677	5154027.813	EDGE OF CONCRETE CURB
P1150	7047247.177	5154026.054	CENTRE OF REMOVABLE BOLLARD
P1151	7047247.330	5154024.719	CENTRE OF REMOVABLE BOLLARD
P1152	7047247.484	5154023.385	CENTRE OF REMOVABLE BOLLARD
P1153	7047247.638	5154021.968	CENTRE OF REMOVABLE BOLLARD
P1154	7047247.791	5154020.634	CENTRE OF REMOVABLE BOLLARD
P1155	7047247.945	5154019.299	CENTRE OF REMOVABLE BOLLARD
P1156	7047248.098	5154017.965	CENTRE OF REMOVABLE BOLLARD
P1157	7047248.252	5154016.630	CENTRE OF REMOVABLE BOLLARD
P1158	7047248.406	5154015.296	CENTRE OF REMOVABLE BOLLARD
P1159	7047248.559	5154013.961	CENTRE OF REMOVABLE BOLLARD
P1160	7047248.713	5154012.627	CENTRE OF REMOVABLE BOLLARD
P1161	7047248.866	5154011.292	CENTRE OF REMOVABLE BOLLARD
P1162	7047249.020	5154009.958	CENTRE OF REMOVABLE BOLLARD
P1163	7047249.173	5154008.623	CENTRE OF REMOVABLE BOLLARD
P1164	7047249.327	5154007.289	CENTRE OF REMOVABLE BOLLARD
P1165	7047249.480	5154005.954	CENTRE OF REMOVABLE BOLLARD
P1166	7047249.634	5154004.619	CENTRE OF REMOVABLE BOLLARD
P1167	7047249.787	5154003.285	CENTRE OF REMOVABLE BOLLARD
P1168	7047249.941	5154001.950	CENTRE OF REMOVABLE BOLLARD
P1169	7047250.094	5154000.616	CENTRE OF REMOVABLE BOLLARD
P1170	7047250.248	5153999.281	CENTRE OF REMOVABLE BOLLARD
P1171	7047250.401	5153997.947	CENTRE OF REMOVABLE BOLLARD
P1172	7047250.555	5153996.612	CENTRE OF REMOVABLE BOLLARD
P1173	7047250.708	5153995.277	CENTRE OF REMOVABLE BOLLARD
P1174	7047250.862	5153993.943	CENTRE OF REMOVABLE BOLLARD
P1175	7047251.015	5153992.608	CENTRE OF REMOVABLE BOLLARD
P1176	7047251.169	5153991.274	CENTRE OF REMOVABLE BOLLARD
P1177	7047251.322	5153989.939	CENTRE OF REMOVABLE BOLLARD
P1178	7047251.476	5153988.604	CENTRE OF REMOVABLE BOLLARD
P1179	7047251.629	5153987.270	CENTRE OF REMOVABLE BOLLARD
P1180	7047251.783	5153985.935	CENTRE OF REMOVABLE BOLLARD
P1181	7047251.936	5153984.601	CENTRE OF REMOVABLE BOLLARD
P1182	7047252.090	5153983.266	CENTRE OF REMOVABLE BOLLARD
P1183	7047252.243	5153981.931	CENTRE OF REMOVABLE BOLLARD
P1184	7047252.397	5153980.597	CENTRE OF REMOVABLE BOLLARD
P1185	7047252.550	5153979.262	CENTRE OF REMOVABLE BOLLARD
P1186	7047252.704	5153977.928	CENTRE OF REMOVABLE BOLLARD
P1187	7047252.857	5153976.593	CENTRE OF REMOVABLE BOLLARD
P1188	7047253.011	5153975.258	CENTRE OF REMOVABLE BOLLARD
P1189	7047253.164	5153973.924	CENTRE OF REMOVABLE BOLLARD
P1190	7047253.318	5153972.589	CENTRE OF REMOVABLE BOLLARD
P1191	7047253.471	5153971.255	CENTRE OF REMOVABLE BOLLARD
P1192	7047253.625	5153969.920	CENTRE OF REMOVABLE BOLLARD
P1193	7047253.778	5153968.585	CENTRE OF REMOVABLE BOLLARD
P1194	7047253.932	5153967.251	CENTRE OF REMOVABLE BOLLARD
P1195	7047254.085	5153965.916	CENTRE OF REMOVABLE BOLLARD
P1196	7047254.239	5153964.582	CENTRE OF REMOVABLE BOLLARD
P1197	7047254.392	5153963.247	CENTRE OF REMOVABLE BOLLARD
P1198	7047254.546	5153961.912	CENTRE OF REMOVABLE BOLLARD
P1199	7047254.699	5153960.578	CENTRE OF REMOVABLE BOLLARD
P1200	7047254.853	5153959.243	CENTRE OF REMOVABLE BOLLARD
P1201	7047255.006	5153957.909	CENTRE OF REMOVABLE BOLLARD
P1202	7047255.160	5153956.574	CENTRE OF REMOVABLE BOLLARD
P1203	7047255.313	5153955.240	CENTRE OF REMOVABLE BOLLARD
P1204	7047255.467	5153953.905	CENTRE OF REMOVABLE BOLLARD
P1205	7047255.620	5153952.570	CENTRE OF REMOVABLE BOLLARD
P1206	7047255.774	5153951.236	CENTRE OF REMOVABLE BOLLARD
P1207	7047255.927	5153949.901	CENTRE OF REMOVABLE BOLLARD
P1208	7047256.081	5153948.567	CENTRE OF REMOVABLE BOLLARD
P1209	7047256.234	5153947.232	CENTRE OF REMOVABLE BOLLARD
P1210	7047256.388	5153945.897	CENTRE OF REMOVABLE BOLLARD
P1211	7047256.541	5153944.563	CENTRE OF REMOVABLE BOLLARD
P1212	7047256.695	5153943.228	CENTRE OF REMOVABLE BOLLARD
P1213	7047256.848	5153941.894	CENTRE OF REMOVABLE BOLLARD
P1214	7047257.002	5153940.559	CENTRE OF REMOVABLE BOLLARD
P1215	7047257.155	5153939.224	CENTRE OF REMOVABLE BOLLARD
P1216	7047257.309	5153937.890	CENTRE OF REMOVABLE BOLLARD
P1217	7047257.462	5153936.555	CENTRE OF REMOVABLE BOLLARD
P1218	7047257.616	5153935.221	CENTRE OF REMOVABLE BOLLARD
P1219	7047257.769	5153933.886	CENTRE OF REMOVABLE BOLLARD
P1220	7047257.923	5153932.551	CENTRE OF REMOVABLE BOLLARD
P1221	7047258.076	5153931.217	CENTRE OF REMOVABLE BOLLARD
P1222	7047258.230	5153929.882	CENTRE OF REMOVABLE BOLLARD
P1223	7047258.383	5153928.548	CENTRE OF REMOVABLE BOLLARD
P1224	7047258.537	5153927.213	CENTRE OF REMOVABLE BOLLARD
P1225	7047258.690	5153925.878	CENTRE OF REMOVABLE BOLLARD
P1226	7047258.844	5153924.544	CENTRE OF REMOVABLE BOLLARD
P1227	7047258.997	5153923.209	CENTRE OF REMOVABLE BOLLARD
P1228	7047259.151	5153921.875	CENTRE OF REMOVABLE BOLLARD
P1229	7047259.304	5153920.540	CENTRE OF REMOVABLE BOLLARD
P1230	7047259.458	5153919.205	CENTRE OF REMOVABLE BOLLARD
P1231	7047259.611	5153917.871	CENTRE OF REMOVABLE BOLLARD
P1232	7047259.765	5153916.536	CENTRE OF REMOVABLE BOLLARD
P1233	7047259.918	5153915.202	CENTRE OF REMOVABLE BOLLARD
P1234	7047260.072	5153913.867	CENTRE OF REMOVABLE BOLLARD
P1235	7047260.225	5153912.532	CENTRE OF REMOVABLE BOLLARD
P1236	7047260.379	5153911.198	CENTRE OF REMOVABLE BOLLARD
P1237	7047260.532	5153909.863	CENTRE OF REMOVABLE BOLLARD
P1238	7047260.686	5153908.529	CENTRE OF REMOVABLE BOLLARD
P1239	7047260.839	5153907.194	CENTRE OF REMOVABLE BOLLARD
P1240	7047260.993	5153905.859	CENTRE OF REMOVABLE BOLLARD
P1241	7047261.146	5153904.525	CENTRE OF REMOVABLE BOLLARD
P1242	7047261.300	5153903.190	CENTRE OF REMOVABLE BOLLARD
P1243	7047261.453	5153901.856	CENTRE OF REMOVABLE BOLLARD
P1244	7047261.607	5153900.521	CENTRE OF REMOVABLE BOLLARD
P1245	7047261.760	5153899.186	CENTRE OF REMOVABLE BOLLARD
P1246	7047261.914	5153897.852	CENTRE OF REMOVABLE BOLLARD
P1247	7047262.067	5153896.517	CENTRE OF REMOVABLE BOLLARD
P1248	7047262.221	5153895.183	CENTRE OF REMOVABLE BOLLARD
P1249	7047262.374	5153893.848	CENTRE OF REMOVABLE BOLLARD
P1250	7047262.528	5153892.513	CENTRE OF REMOVABLE BOLLARD
P1251	7047262.681	5153891.179	CENTRE OF REMOVABLE BOLLARD
P1252	7047262.835	5153889.844	CENTRE OF REMOVABLE BOLLARD
P1253	7047262.988	5153888.510	CENTRE OF REMOVABLE BOLLARD
P1254	7047263.142	5153887.175	CENTRE OF REMOVABLE BOLLARD
P1255	7047263.295	5153885.840	CENTRE OF REMOVABLE BOLLARD
P1256	7047263.449	5153884.506	CENTRE OF REMOVABLE BOLLARD
P1257	7047263.602	5153883.171	CENTRE OF REMOVABLE BOLLARD
P1258	7047263.756	5153881.837	CENTRE OF REMOVABLE BOLLARD
P1259	7047263.909	5153880.502	CENTRE OF REMOVABLE BOLLARD
P1260	7047264.063	5153879.167	CENTRE OF REMOVABLE BOLLARD
P1261	7047264.216	5153877.833	CENTRE OF REMOVABLE BOLLARD
P1262	7047264.370	5153876.498	CENTRE OF REMOVABLE BOLLARD
P1263	7047264.523	5153875.164	CENTRE OF REMOVABLE BOLLARD
P1264	7047264.677	5153873.829	CENTRE OF REMOVABLE BOLLARD
P1265	7047264.830	5153872.494	CENTRE OF REMOVABLE BOLLARD
P1266	7047264.984	5153871.160	CENTRE OF REMOVABLE BOLLARD
P1267	7047265.137	5153869.825	CENTRE OF REMOVABLE BOLLARD
P1268	7047265.291	5153868.491	CENTRE OF REMOVABLE BOLLARD
P1269	7047265.444	5153867.156	CENTRE OF REMOVABLE BOLLARD
P1270	7047265.598	5153865.821	CENTRE OF REMOVABLE BOLLARD
P1271	7047265.751	5153864.487	CENTRE OF REMOVABLE BOLLARD
P1272	7047265.905	5153863.152	CENTRE OF REMOVABLE BOLLARD
P1273	7047266.058	5153861.818	CENTRE OF REMOVABLE BOLLARD
P1274	7047266.212	5153860.483	CENTRE OF REMOVABLE BOLLARD
P1275	7047266.365	5153859.148	CENTRE OF REMOVABLE BOLLARD
P1276	7047266.519	5153857.814	CENTRE OF REMOVABLE BOLLARD
P1277	7047266.672	5153856.479	CENTRE OF REMOVABLE BOLLARD
P1278	7047266.826	5153855.145	CENTRE OF REMOVABLE BOLLARD
P1279	7047266.979	5153853.810	CENTRE OF REMOVABLE BOLLARD
P1280	7047267.133	5153852.475	CENTRE OF REMOVABLE BOLLARD
P1281	7047267.286	5153851.141	CENTRE OF REMOVABLE BOLLARD
P1282	7047267.440	5153849.806	CENTRE OF REMOVABLE BOLLARD
P1283	7047267.593	5153848.472	CENTRE OF REMOVABLE BOLLARD
P1284	7047267.747	5153847.137	CENTRE OF REMOVABLE BOLLARD
P1285	7047267.900	5153845.802	CENTRE OF REMOVABLE BOLLARD
P1286	7047268.054	5153844.468	CENTRE OF REMOVABLE BOLLARD
P1287	7047268.207	5153843.133	CENTRE OF REMOVABLE BOLLARD
P1288	7047268.361	5153841.799	CENTRE OF REMOVABLE BOLLARD
P1289	7047268.514	5153840.464	CENTRE OF REMOVABLE BOLLARD
P1290	7047268.668	5153839.129	CENTRE OF REMOVABLE BOLLARD
P1291	7047268.821	5153837.795	CENTRE OF REMOVABLE BOLLARD
P1292	7047268.975	5153836.460	CENTRE OF REMOVABLE BOLLARD
P1293	7047269.128	5153835.126	CENTRE OF REMOVABLE BOLLARD
P1294	7047269.282	5153833.791	CENTRE OF REMOVABLE BOLLARD
P1295	7047269.435	5153832.456	CENTRE OF REMOVABLE BOLLARD
P1296	7047269.589	5153831.122	CENTRE OF REMOVABLE BOLLARD
P1297	7047269.742	5153829.787	CENTRE OF REMOVABLE BOLLARD
P1298	7047269.896	5153828.453	CENTRE OF REMOVABLE BOLLARD
P1299	7047270.049	5153827.118	CENTRE OF REMOVABLE BOLLARD
P1300	7047270.203	5153825.783	CENTRE OF REMOVABLE BOLLARD
P1301	7047270.356	5153824.449	CENTRE OF REMOVABLE BOLLARD
P1302	7047270.510	5153823.114	CENTRE OF REMOVABLE BOLLARD
P1303	7047270.663	5153821.780	CENTRE OF REMOVABLE BOLLARD
P1304	7047270.817	5153820.445	CENTRE OF REMOVABLE BOLLARD
P1305	7047270.970	5153819.110	CENTRE OF REMOVABLE BOLLARD
P1306	7047271.124	5153817.776	CENTRE OF REMOVABLE BOLLARD
P1307	7047271.277	5153816.441	CENTRE OF REMOVABLE BOLLARD
P1308	7047271.431	5153815.107	CENTRE OF REMOVABLE BOLLARD
P1309	7047271.584	5153813.772	CENTRE OF REMOVABLE BOLLARD
P1310	7047271.738	5153812.437	CENTRE OF REMOVABLE BOLLARD
P1311	7047271.891	5153811.103	CENTRE OF REMOVABLE BOLLARD
P1312	7047272.045	5153809.768	CENTRE OF REMOVABLE BOLLARD
P1313	7047272.198	5153808.434	CENTRE OF REMOVABLE BOLLARD
P1314	7047272.352	5153807.099	CENTRE OF REMOVABLE BOLLARD
P1315	7047272.505	5153805.764	CENTRE OF REMOVABLE BOLLARD
P1316	7047272.659	5153804.430	CENTRE OF REMOVABLE BOLLARD
P1317	7047272.812	5153803.095	CENTRE OF REMOVABLE BOLLARD
P1318	7047272.966	5153801.761	CENTRE OF REMOVABLE BOLLARD
P1319	7047273.119	5153800.426	CENTRE OF REMOVABLE BOLLARD
P1320	7047273.273	5153799.091	CENTRE OF REMOVABLE BOLLARD
P1321	7047273.426	5153797.757	CENTRE OF REMOVABLE BOLLARD
P1322	7047273.580	5153796.422	CENTRE OF REMOVABLE BOLLARD
P1323	7047273.733	5153795.088	CENTRE OF REMOVABLE BOLLARD
P1324	7047273.887	5153793.753	CENTRE OF REMOVABLE BOLLARD
P1325	7047274.040	5153792.418	CENTRE OF REMOVABLE BOLLARD
P1326	7047274.194	5153791.084	CENTRE OF REMOVABLE BOLLARD
P1327	7047274.347	5153789.749	CENTRE OF REMOVABLE BOLLARD
P1328	7047274.501	5153788.415	CENTRE OF REMOVABLE BOLLARD
P1329	7047274.654	5153787.080	CENTRE OF REMOVABLE BOLLARD
P1330	7047274.808	5153785.745	CENTRE OF REMOVABLE BOLLARD
P1331	7047274.961	5153784.411	CENTRE OF REMOVABLE BOLLARD
P1332	7047275.115	5153783.076	CENTRE OF REMOVABLE BOLLARD
P1333	7047275.268	5153781.742	CENTRE OF REMOVABLE BOLLARD
P1334	7047275.422	5153780.407	CENTRE OF REMOVABLE BOLLARD
P1335	7047275.575	5153779.072	CENTRE OF REMOVABLE BOLLARD
P1336	7047275.729	5153777.738	CENTRE OF REMOVABLE BOLLARD
P1337	7047275.882	5153776.403	CENTRE OF REMOVABLE BOLLARD
P1338	7047276.036	5153775.069	CENTRE OF REMOVABLE BOLLARD
P1339	7047276.189	5153773.734	CENTRE OF REMOVABLE BOLLARD
P1340	7047276.343	5153772.399	CENTRE OF REMOVABLE BOLLARD
P1341	7047276.496	5153771.065	CENTRE OF REMOVABLE BOLLARD
P1342	7047276.650	5153769.730	CENTRE OF REMOVABLE BOLLARD
P1343	7047276.803	5153768.396	CENTRE OF REMOVABLE BOLLARD
P1344	7047276.957	5153767.061	CENTRE OF REMOVABLE BOLLARD
P1345	7047277.110	5153765.726	CENTRE OF REMOVABLE BOLLARD
P1346	7047277.264	5153764.392	CENTRE OF REMOVABLE BOLLARD
P1347	7047277.417	5153763.057	CENTRE OF REMOVABLE BOLLARD
P1348	7047277.571	5153761.723	CENTRE OF REMOVABLE BOLLARD
P1349	7047277.724	5153760.388	CENTRE OF REMOVABLE BOLLARD
P1350	7047277.878	5153759.053	CENTRE OF REMOVABLE BOLLARD
P1351	7047278.031	5153757.719	CENTRE OF REMOVABLE BOLLARD
P1352	7047278.185	5153756.384	CENTRE OF REMOVABLE BOLLARD
P1353	7047278.338	5153755.050	CENTRE OF REMOVABLE BOLLARD
P1354	7047278.492	5153753.715	CENTRE OF REMOVABLE BOLLARD
P1355	7047278.645	5153752.380	CENTRE OF REMOVABLE B



01 L2.04 PLAYGROUND ENLARGEMENT
SCALE: 1:50

PLAYGROUND EQUIPMENT LIST

SENIOR PLAY STRUCTURE:

ACCESSIBLE PLAY PANELS:

NOTE

PLAYGROUND CERTIFICATION

NOTE

LEGEND

KEY PLAN

DRAWING ISSUE RECORD

NO.	DATE	DRAWING ISSUE RECORD	BY
3	22-03-25	ISSUED FOR TENDER	PDF
2	21-09-17	ISSUED FOR PRICING	PDF
1	21-06-25	ISSUED FOR 50% REVIEW	PDF
0	21-04-09	DRAWING ISSUE RECORD	MEDIA

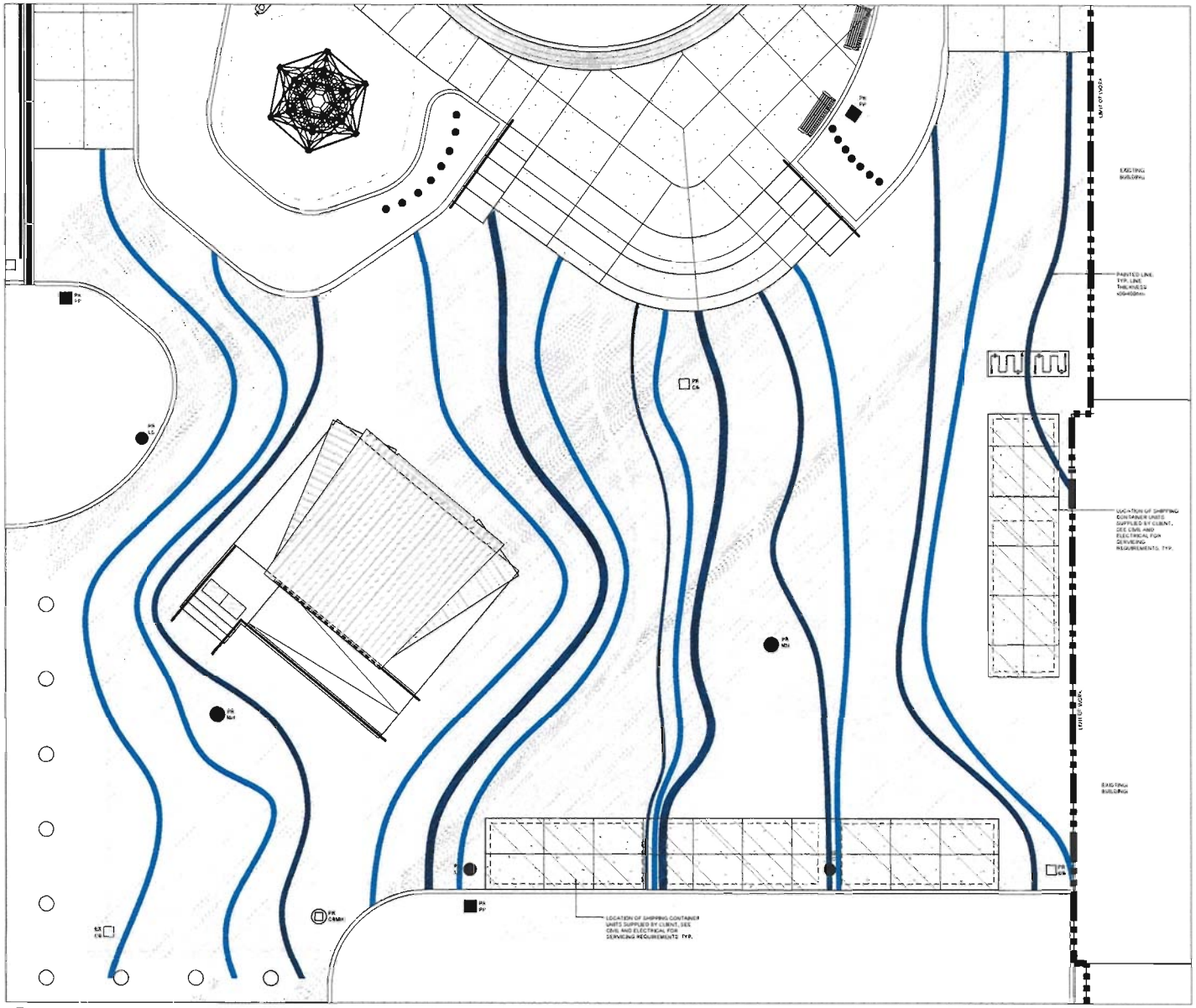
PROJECT
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
PLAYGROUND
EQUIPMENT PLAN

PROJECT No.
19-07b
DESIGNED
TC
DRAWN
LH
DATE
2022-02-25
SCALE
1:50
SHEET No.
L2.04



01 ASPHALT PAINTING ENLARGEMENT
L2.01 SCALE 1:75

KEY PLAN

DRAWING ISSUE RECORD

NO.	YY-MM-DD	DRAWING ISSUE RECORD	BY
3	22-02-25	ISSUED FOR TENDER	PDF
2	21-09-17	ISSUED FOR PRICING	PDF
1	21-06-25	ISSUED FOR SPA REVIEW	PDF

PROJECT

SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT

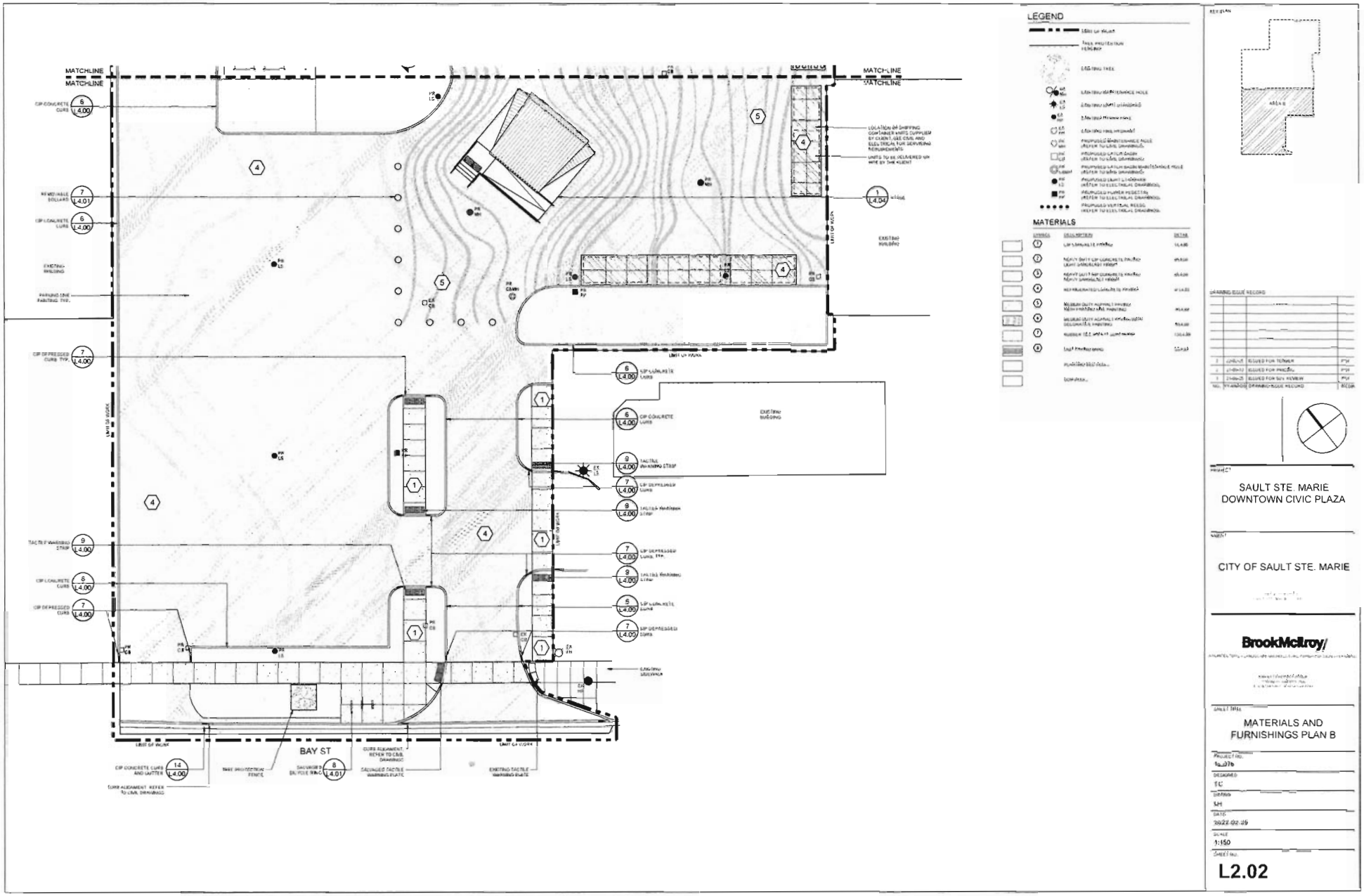
CITY OF SAULT STE. MARIE

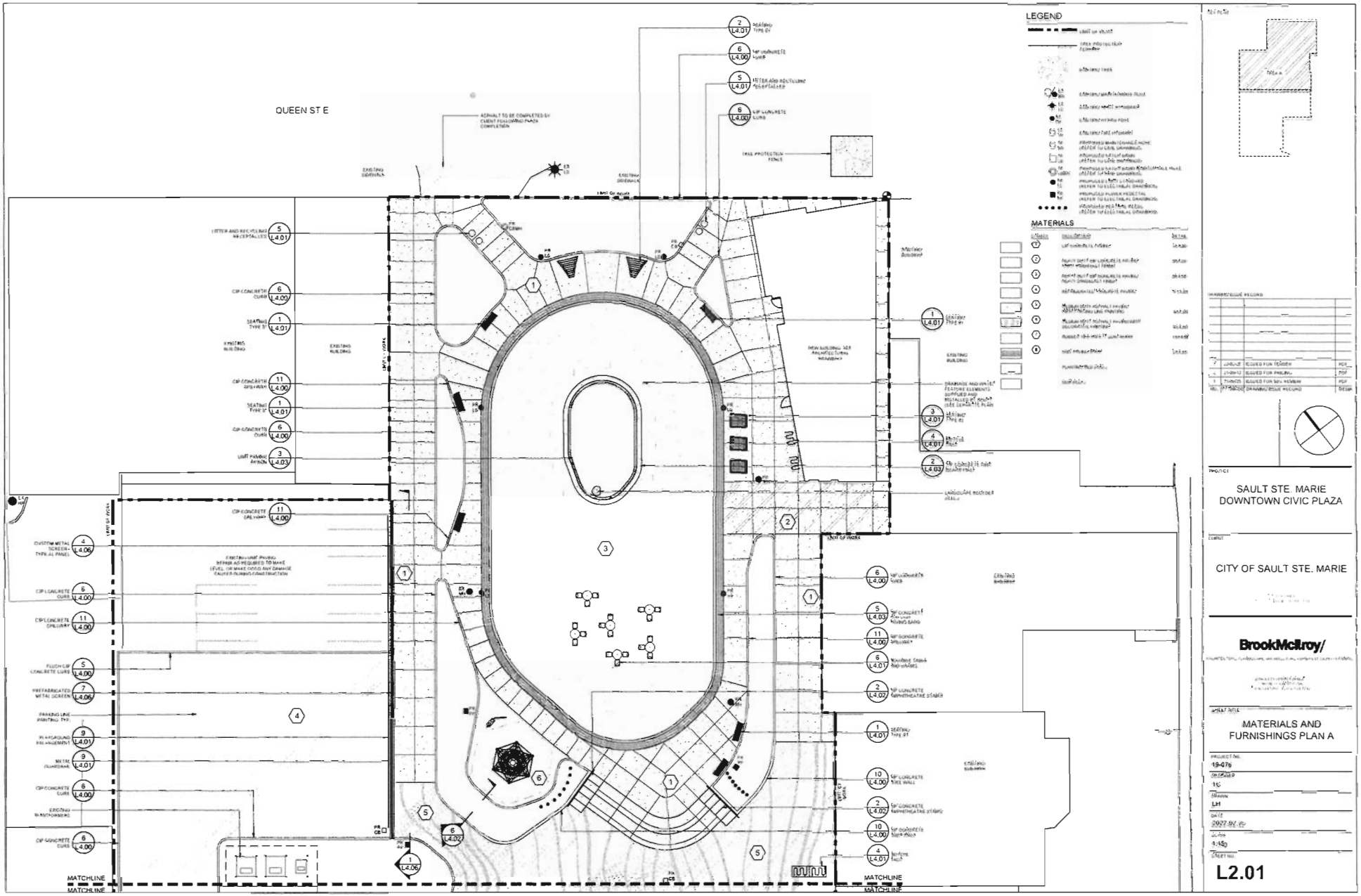
BrookMcIlroy

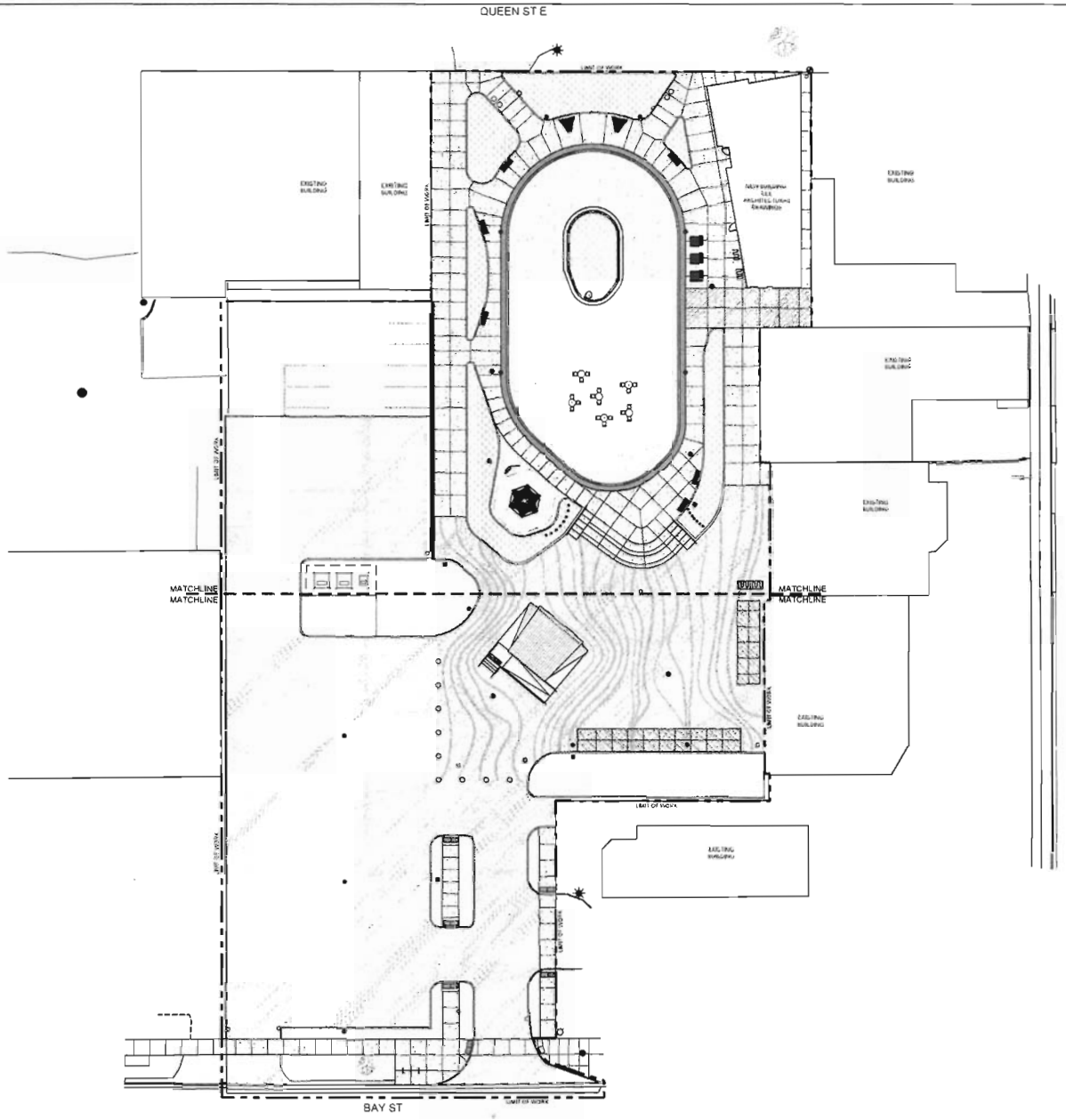
SHEET TITLE

ASPHALT PAINTING ENLARGEMENT

PROJECT NO.
19-076
DESIGNED
TC
DRAWN
LH
DATE
2022-02-25
SCALE
1:75
SHEET NO.
L2.03


MATCHLINE
MATCHLINE
MATCHLINE
MATCHLINE
BAY ST
LEGEND
MATERIALS
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
MATERIALS AND
FURNISHINGS PLAN B
1:150
L2.02


QUEEN ST E
LEGEND
MATERIALS
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
MATERIALS AND
FURNISHINGS PLAN A
L2.01
MATCHLINE
MATCHLINE



LANDSCAPE NOTES

1. THIS DRAWING SET IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. DIMENSIONS ARE FROM FRONT OF CURB OR LEGIBLE COORDINATES. VERIFY DIMENSIONS.
3. DO NOT SCALE DRAWINGS. CONTACT LANDSCAPE ARCHITECT IMMEDIATELY IF THERE IS ANY ABSOLUTE LACK OF INFORMATION OR INCONSISTENCY. OVERLAND FOR THIS WORK AND EXTRA COSTS INCURRED WILL NOT BE ACCEPTED. CONTRACTOR TO READ REPORT WITHIN PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES IN WRITING TO LANDSCAPE ARCHITECT IMMEDIATELY.
4. CONTRACTOR TO REPORT IN WRITING ANY DISCREPANCIES IN THE DRAWINGS, SPECIFICATIONS AND CONTRACT DOCUMENTS TO THE LANDSCAPE ARCHITECT BEFORE THE END OF THE REGIONAL PROCESS AND CONFIRMATION OF WORK FACTORS.
5. THE CONTRACTOR MUST MAKE CAREFUL EXAMINATION OF EXISTING SITE CONDITIONS AND ADVISE THE CONTRACT ADMINISTRATOR OF UNSATISFACTORY SITE CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. COMMENCEMENT OF CONSTRUCTION WILL MEAN THAT THE CONTRACTOR HAS ACCEPTED THE SITE AND NO ALLOWANCE WILL BE MADE LATER FOR ANY EXPENSES INCURRED DUE TO A FAILURE TO NOTE UNSATISFACTORY SITE CONDITIONS.
6. CONTRACTOR IS TO OBTAIN ALL NECESSARY PERMISSION OR LEGAL MUNICIPAL PERMITS REQUIRED. ALL CONSTRUCTION MUST ADHERE TO PROVINCIAL AND LOCAL MUNICIPAL STANDARDS AND APPLICABLE CODES.
7. CONTRACTOR MUST VISIT THE SITE PRIOR TO COMMENCEMENT OF WORK AND REPORT DISCREPANCIES TO CONTRACT ADMINISTRATOR IMMEDIATELY.
8. ANY PLANTS AND OR TREE LOCATION OF CONCERN ARISING PRIOR TO BEGINNING TO STAKING AND/OR STOCKPILES WILL BE ALLOWED ON LOCAL ROADS OR IN TREE PROTECTION ZONES.
9. CONTRACTOR TO ARRANGE UTILITY STAKING PRIOR TO CONSTRUCTION. LOCATION OF POLES, GRID, CONCRETE WATER MAINS, SEWERS, AND OTHER UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS AND WHERE SHOWN THE ACCURACY OF THE POSITION IS NOT GUARANTEED. THIS INFORMATION HAS BEEN REVISED FROM REVISED DRAWINGS ONLY.
10. CONTRACTOR TO PROTECT AND REPAIR ALL EXISTING AND NEW CONSTRUCTION FROM DAMAGE. ANY DAMAGE INCURRED WILL BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
11. CONTRACTOR TO COORDINATE WORK WITH OTHER CONTRACTORS ON SITE.
12. BARRIERS AND FENCING MUST BE PROVIDED TO KEEP UNAUTHORIZED VEHICULAR AND PEDESTRIAN TRAFFIC FROM ENTERING THE SITE. OPEN HOLES MUST BE NOTED BY HIGH VISIBILITY.
13. INSTALL SEDIMENT AND EROSION CONTROL MEASURES PRIOR TO COMMENCEMENT OF WORK. SUPPLY AND MAINTAIN AS A DAILY BASIS.
14. AREAS OUTSIDE OF THE CONSTRUCTION ZONE MUST BE KEPT CLEAN AND USABLE AT ALL TIMES.
15. CONTRACTOR MUST SUBMIT SAMPLES OR SHOP DRAWINGS OF ALL MATERIALS TO LANDSCAPE ARCHITECT PRIOR TO ORDERING AS PER SPECIFICATIONS. ANY COSTS INCURRED BY FAILING TO OBTAIN CONSENT FROM THE LANDSCAPE ARCHITECT ARE THE CONTRACTOR'S RESPONSIBILITY.
16. DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CLIENT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.
17. ALL WORK TO BE REVIEWED BY LANDSCAPE ARCHITECT PRIOR TO PAYMENT APPROVAL.
18. CONTRACTOR TO PROVIDE AS-BUILT DRAWINGS OF WORK PRIOR TO SUBSTANTIAL COMPLETION.

LEGEND

LIMIT OF WORK

EXISTING TREE

DRAWING ISSUE RECORD

No.		Issued	
1	2022-02-25	ISSUED FOR TENDER	PDF
2	2022-02-12	ISSUED FOR PRICING	PDF
3	2022-01-25	ISSUED FOR SPA REVIEW	PDF
No.	YYYY-MM-DD	DRAWING ISSUE RECORD	REVIEW

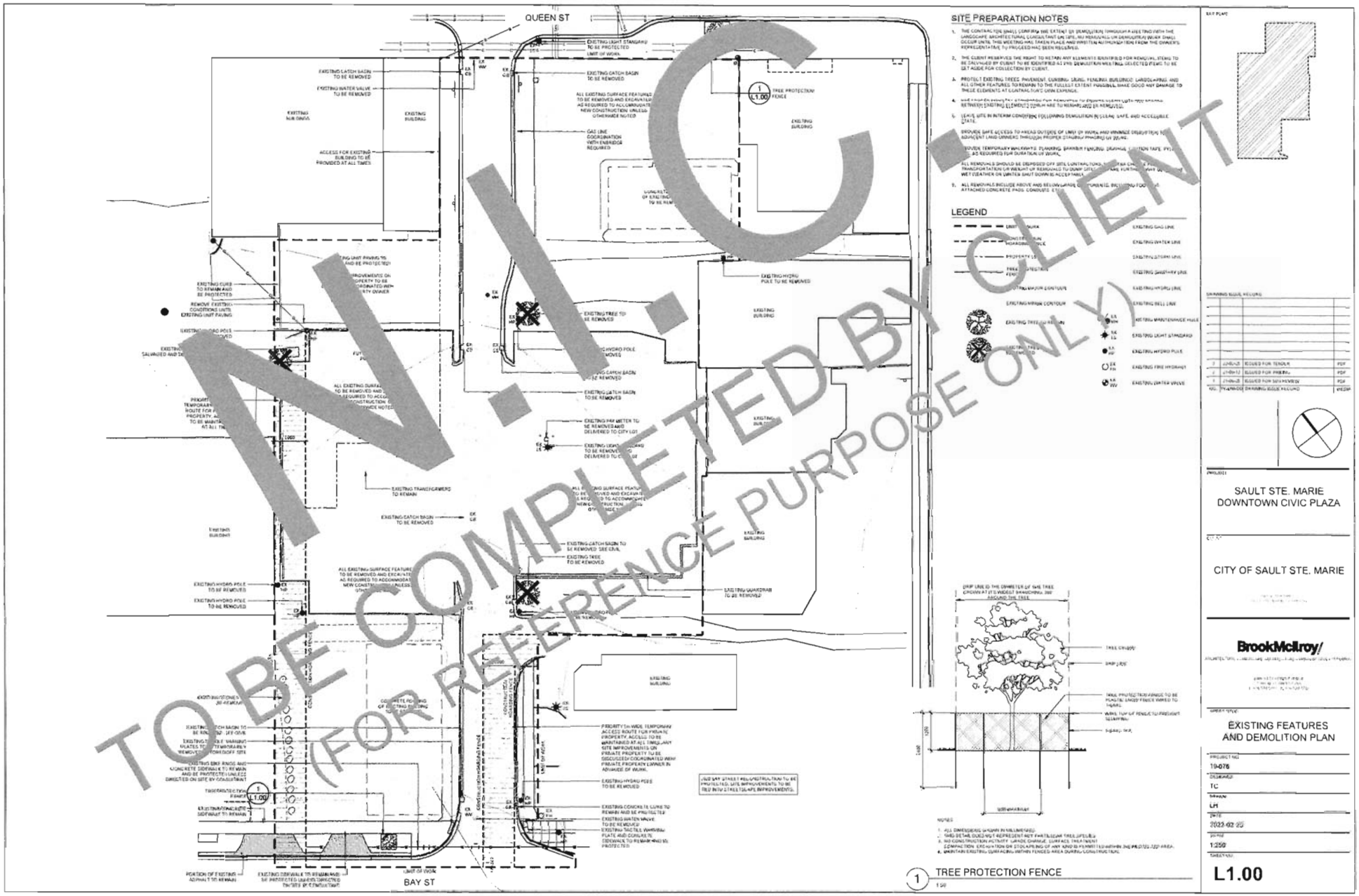
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CLIENT
CITY OF SAULT STE. MARIE

BrookMcIlroy

SHEET TITLE
OVERALL
LANDSCAPE PLAN

PROJECT No.
19-076
REVIEWED
TC
DRAWN
LM
DATE
2022-02-25
SCALE
1:250
SHEET No.
L2.00



N.I.C.
TO BE COMPLETED BY CLIENT
(FOR REFERENCE PURPOSE ONLY)

SAULT STE MARIE - DOWNTOWN CIVIC PLAZA

Queen Street S, Sault Ste. Marie, ON P6A 2A3
PROJECT No.: 2022CDE-PE-02-T

LEAD CONSULTANT
ARCHITECT/LANDSCAPE

Brook McIlroy Incorporated

200-161 Spadina Avenue
Toronto, ON M5V 2L6
www.brookmcilroy.com

t. 416-504-5997
info@brookmcilroy.com

MECHANICAL AND
ASSOCIATE ARCHITECTS:

MGP Architects and Engineers

123 East Street
Sault Ste. Marie, ON P6A 3C7
www.mgp-arch-eng.ca

t. 705-942-9494

STRUCTURAL/CIVIL:

Tulloch Engineering

71 Black Rd #8
Sault Ste. Marie, ON P6B 0A3
www.tulloch.ca

t. 705-949-1457
saultstemarie@tulloch.ca

ELECTRICAL AND AV:

Mulvey and Banani

90 Sheppard Avenue East #500
Toronto ON M2N 3A1
www.mbii.com

t: 416-751-2520

REFRIGERATION:

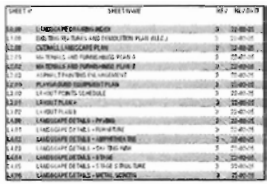
CIMCO TOROMONT

65 Villiers St.
Toronto, ON M5A 3S1
www.cimcorefrigeration.com

t. 416-465-7581

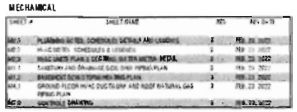
LIST OF DRAWINGS

LANDSCAPE ARCHITECTURE

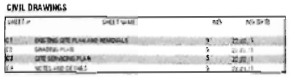


ARCHITECTURE

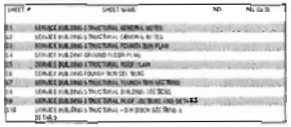
MECHANICAL



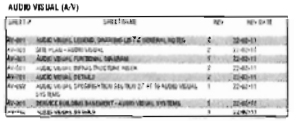
CIVIL DRAWINGS



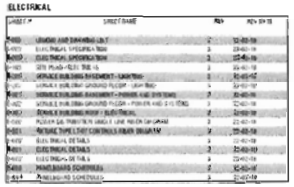
STRUCTURAL DRAWINGS



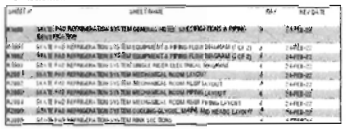
AUDIO VISUAL (A/V)



ELECTRICAL



REFRIGERATION



KEY MAP

Verification Soil Sampling Program

535 Queen Street East, Sault Ste. Marie, Ontario – Historic Contamination

December 10, 2021
TULLOCH Project #: 21-1338

TULLOCH

71 Black Rd. Unit 8
Sault Ste. Marie, ON
P6B 0A3

T. 705.949.1457
TF. 866.806.6602
F. 705.949.9606
saultstemarie@tulloch.ca
www.TULLOCH.ca

December 10, 2021
21-1338

Re: Verification Soil Sampling Program – Historic Contamination
535 Queen Street East, Sault Ste. Marie, Ontario

Dear Mr. Tom Vair:

Please find enclosed the final version of TULLOCH's Report entitled "Verification Soil Sampling Program – Historic Contamination at 535 Queen Street East, Sault Ste. Marie, Ontario".

Should you have questions, concerns or wish to discuss, please contact the undersigned at your convenience.

Sincerely,
TULLOCH Inc.

Tyler Moody, A.Sc.T.
Project Manager

tyler.moody@tulloch.ca

Encl.

Distribution List

# Of Hard Copies	PDF Required	Association / Company Name
	1	Corporation of the City of Sault Ste. Marie

Revision Log

Revision #	Revised By	Date	Issue / Revision Description

EXECUTIVE SUMMARY

TULLOCH Inc. (TULLOCH) was retained by the Corporation of the City of Sault Ste. Marie (Client) to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum hydrocarbon (PHC) impacted soils at the property located at 535 Queen Street East, Sault Ste. Marie, Ontario (Site).

The terms of reference for this project are based on TULLOCH being retained by the Client on June 2, 2021.

The objective of this VSSP was to to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum-impacted soils identified by the Client following the Phase I ESA assessment of the Site, and to verify that the soil at the final limits of the remedial excavation satisfy the applicable Ontario Ministry of the Environment, Conservation and Parks (MECP) Standards. The source and quantity of the impacts were suspected to be from former pump station and former auto repair garage.

The following is a summary of work completed during this VSSP:

- TULLOCH field personnel attended the Site between June 3 and July 15, 2021;
- One "worst-case" soil sample representative of the soil impacts was collected, and submitted for TCLP analysis;
- TULLOCH field personnel supervised and documented the removal of impacted soil through excavation, to complete a VSSP;
- Field observations made during the remedial excavation indicated the soil stratigraphy below surface consists of a heterogeneous layer of silty sand and gravel followed by reddish sandstone/bedrock, to the maximum depth of the excavation of 2.5 metres below ground surface (mbgs). Groundwater was not encountered during this investigation.
- Based on Site specific information, the soil quality was assessed based on the MECP Table 3 SCS for coarse soil types and industrial/commercial/community property uses;
- The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for disposal of impacted soils. The impacted soil was transported by The City of Sault Ste. Marie Public Works Department to the City of Sault Ste. Marie

Landfill Disposal Site, an MECP-approved facility licensed to accept solid non-hazardous waste, located in Sault Ste. Marie, Ontario;

- Based on the size of the remedial excavation, ten "worst-case" wall samples were collected from the final limits of the excavation, including one duplicate sample, as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the potential contaminants of concern: BTEX, PHCs (F1-F4) and lead; sandstone/bedrock was discovered at the base of the excavation (2.5 mbgs), therefore, no floor samples were collected during the excavation.
- PHC odours were identified in the final soil limits along the base of the west and north walls. One soil sample collected within these PHC odours (soil sample SS-040) met the Table 3 SCS. Since the soil sample with the PHC odours met the Table 3 SCS, TULLOCH assumes that these impacts are mature and thus the PHC impacts have depleted over time.

The extents of the impacted soils have been removed from the Site up to the extent of the bedrock at 2.5 m or less, which is deemed to be practicable. The measurable BTEX, PHCs (F1-F4) and lead soil concentrations from the remaining final limits of the excavation were below or undetectable compared to the applicable Table 3 Standards (see drawings in Appendix A); therefore, all impacted soils were removed from the Site.

TABLE OF CONTENTS

1. INTRODUCTION 4
2. BACKGROUND 4
3. EXCAVCATION METHODOLOGY 4
3.1 Scope of Work 4
3.2 Remedial Excavation Activities 5
3.3 Excavation Field Screening and Soil Sample Collection 6
3.4 Verification Soil Sampling 6
3.5 Analytical Testing 7
3.6 QA/QC Protocols 7
3.7 Site Condition Standards 8
4. RESULTS 8
4.1 Site Geology 8
4.2 Soil Vapour Concentrations and Field Observations 9
4.3 Analytical Results 9
4.4 QA/QC Results 10
4.5 Earthwork Volumes 11
4.6 Groundwater 11
4.7 Backfilling 11
5. CONCLUSIONS 11
6. DISCLAIMER 13
7. CLOSURE 15

LIST OF FIGURES

Figure 1 Excavation Key Plan
Figure 2 Sample Location Plan

LIST OF TABES

Table 1 Soil Verification Results

LIST OF APPENDICES

Appendix A Figures
Appendix B Photographs
Appendix C Summary Tables
Appendix D Laboratory Certificates of Analysis
Appendix E TCLP Letter & Disposal Slip

1. INTRODUCTION

TULLOCH Inc. (TULLOCH) was retained by The Corporation of the City of Sault Ste. Marie (Client) on June 2, 2021 to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum hydrocarbon (PHC) impacted soils at the property located at 535 Queen Street East, Sault Ste. Marie, Ontario (Site).

As indicated on Figure 1 (Site Location Map), the Site is located on the southeast corner of the intersection of Queen Street East and Bingham Street, in Sault Ste. Marie, Ontario. The area of remediation was primarily the central and west portions of the Site; as shown on Figure 2 (Sample Location Plan). All figures are provided in Appendix A.

2. BACKGROUND

TULLOCH previously performed a Phase I and II ESA for the Site in 2020 and determined that the central and west portions of the Site had historic petroleum impacts in the soils from a former fueling station and repair garage on the Site. TULLOCH was retained on June 2, 2021, to remediate the historic petroleum soil impacts.

3. EXCAVCATION METHODOLOGY

3.1 Scope of Work

The scope of work completed by TULLOCH, as part of the remediation and VSSP, included the following:

- Provide on-Site documentation of petroleum hydrocarbon (PHC) impacted soil removal activities to record field observations during the excavation process, which included visual and olfactory evidence of soil impacts following a field screening program using a Catalytic Combustion Monitor (CCM);
- Upon removal of the PHC-impacted soil from the subsurface, and once the excavation limits have been established, remedial verification soil samples were collected from the walls and floors of the excavation to identify any residual soil contaminant levels. The sampling plan was prepared and performed in accordance with the Ministry of Environment, Conservation and Parks (MECP) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" dated December 1996, (MECP Sampling Document);

- All remedial verification soil samples collected as part of this program were submitted to an independent and accredited laboratory for analysis of the following potential contaminants of concern: benzene, toluene, ethylbenzene, xylenes (BTEX), PHCs fractions F1 through F4 (F1-F4) and lead;
- TULLOCH completed an assessment of the Site to determine the appropriate site condition standards as identified in the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" dated April 15, 2011 (2011 MECP Standards);
- TULLOCH collected and submitted field duplicate soil samples for quality assurance and quality control (QA/QC) purposes; which were analyzed for the potential contaminants of concern;
- Upon receipt of the soil analytical data, TULLOCH compared the results with the applicable criteria stipulated in the 2011 MECP Standards; and
- TULLOCH prepared a report documenting the findings of the assessment and recommendations related to subsurface impacts.

3.2 Remedial Excavation Activities

TULLOCH field personnel attended the Site between June 3 and July 15, 2021, to conduct, supervise and document the removal of impacted soil from the excavation and to complete a VSSP. The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for the disposal of impacted soil at the City of Sault Ste. Marie Landfill. Pending receipt of the TCLP soil analytical results, the impacted soils were transported to The City of Sault Ste Maire in Sault Ste. Marie, Ontario, an MECP-approved facility licensed to accept solid non-hazardous waste.

Subsurface conditions were logged by TULLOCH personnel during the remedial excavation. Soil samples were strategically collected from the sidewalls and floor of the final excavation for field screening purposes, visual and olfactory classification, as well as for submission for laboratory analysis and verification. Site photographs of the remedial activities completed are located in Appendix B.

3.3 Excavation Field Screening and Soil Sample Collection

Field sampling was completed in accordance with the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996 (MECP Sampling Guidelines).

The encountered stratigraphy (e.g., major soil types, colour and moisture), as well as visual and olfactory evidence of potential environmental contamination was noted. Soil samples were split and deposited into laboratory supplied jars and placed on ice to preserve sample integrity for laboratory submission; the second half of the sample was placed into plastic Ziploc® bags and left in a warm area and left to volatilize under warm temperatures for a minimum of 10 minutes. Measurement of headspace vapour concentrations were taken from each soil sample recovered using portable hydrocarbon detection instrument (RKI Eagle) to measure total combustible organic vapours (COVs).

Clean nitrile gloves were used between samples throughout the investigation program to prevent cross-contamination of the recovered samples. Samples to be shipped for chemical analysis were packaged in coolers with sufficient packing material to ensure safe shipment of glass containers. Samples were kept cool (<10°C) with ice or ice packs.

TULLOCH placed soil samples for laboratory analysis directly into new, labeled, laboratory-supplied containers. TULLOCH packed the soil into the containers minimizing the volume of headspace in each sample reducing the potential for volatile losses. Labeled samples were placed in coolers with ice for temporary storage and transport to the analytical laboratory. TULLOCH transported the soil samples using standard chain-of-custody procedures. The final limits of the remedial excavation illustrating the field screening sample locations, COV concentrations and locations of verification soil samples submitted for analysis are depicted on Figure 2, located in Appendix A.

3.4 Verification Soil Sampling

Following the remedial excavation, a total of ten "worst-case and/or spatially dispersed" sidewall samples, including a field duplicate, were collected from the final excavation limits as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the parameters BTEX, PHCs (F1-F4) and lead.

Samples collected for analysis, along with their respective locations and parameters are provided in Table 1, located in Appendix C.

3.5 Analytical Testing

Since the results of chemical analyses are to be compared to the MECP SCS, it is essential that well documented, validated and consistently applied analytical methods are utilized and that appropriate quality assurance and quality control (QA/QC) procedures be carried out. The samples collected from the Site were submitted to SGS Laboratories in Lakefield, Ontario, which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the "International Standards ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories", dated December 15, 1999. All analyses used the analytical methods prescribed in the "*Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*", as amended.

3.6 QA/QC Protocols

QA/QC protocols were followed during excavation activities and verification sampling to ensure that representative samples were obtained. Field protocols that were employed included:

- Soil samples were extracted from the interior of the sampling device (where possible) or face of excavation, rather than from areas in contact with the sampler walls to minimize the potential for cross-contamination;
- Soil samples collected were placed in laboratory-supplied glass sample jars;
- Refrigeration / icing of all samples immediately upon collection and maintained en route to the laboratory;
- Dedicated and disposable Nitrile™ gloves were used for all sample handling;
- All non-dedicated sampling equipment was cleaned prior to initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture;
- One field duplicate sample was collected and analyzed were submitted for all parameters of concern and an evaluation of the relative percent difference calculations was completed; and
- Sample collection and handling procedures were performed in accordance with industry standards and the MECP Sampling Document.

SGS's internal laboratory QA/QC consisted of the analysis of a laboratory duplicate, method blank and matrix spike, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries for the method blank and matrix spike samples.

3.7 Site Condition Standards

The Site is a commercial property located within Sault Ste. Marie. It is TULLOCH's understanding that potable water for the Site and surrounding area is supplied by a municipal water system.

The results of the soil and water analyses were compared to the generic criteria described in the MECP's "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011" under O. Reg. 153/04 (O. Reg. 153/04), as amended by O.Reg.511/09 (MECP SCS).

Ontario Regulation 153/04 (as amended) states that a Site is classified as an "environmentally sensitive area" if the pH of the surface soil (less than 1.5 mbgs) is less than 5 or greater than 9, the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the Site is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. TULLOCH 2020 Phase II ESA previously identified that soils at the Site are within the specified range. The Site is not an area of natural significance, and it is not adjacent to, nor does it contain, land within 30 metres of an area of natural significance. As such, the Site is not considered to be an environmentally sensitive area.

The Site is not within 30 metres of a waterbody.

Based on the above, the appropriate MECP SCS for the Site is Table 3: Generic Site Condition Standards in a Non-Potable Ground Water Condition for coarse soils for Industrial/Commercial/Community land uses.

As such, all analytical results have been compared to these *Table 3 SCS MECP Standards.*

4. RESULTS

4.1 Site Geology

Based on the soil samples recovered from the remedial excavation, the soil stratigraphy below surface consists of brown silty sand and gravel, to the maximum depth of the excavation of 2.5

mbgs. Sandstone bedrock was encountered at 2.5 mbgs and groundwater was not encountered during the excavation. Based on the elevation of the Site and the St. Marys River to the south, the groundwater level is anticipated to be within the bedrock below the on-Site excavations.

4.2 Soil Vapour Concentrations and Field Observations

Vapour concentrations measured in the verification soil samples collected during the remedial excavation investigation are presented on Figure 2 in Appendix A. Vapour concentrations were measured between 0 and 8 ppm among the extents of the final remedial excavation.

PHC odours were identified in the final soil limits along the base of the west and north walls. No odours or staining were observed along the remaining final limits of the remedial excavation.

4.3 Analytical Results

Soil Results

As indicated in Table 2 in Appendix C, all other reported concentrations of BTEX, PHCs (F1-F4) and lead in the soil samples from the final extents of the remedial excavation met the Table 3 SCS.

As indicated above, PHC odours were identified in the final soil limits along the base of the west and north walls. One sample of the soil samples with an odour was collected (soil sample SS-040) and met the Table 3 SCS. The soil sample with the PHC odour met the Table 3 SCS, TULLOCH assumes that these impacts are mature and thus the PHC impacts have depleted over time.

Waste Characterization Results

A copy of the TCLP analytical results and soils disposal letter along with the leachate quality criteria listed in Schedule 4 of Ontario Regulation 347 (as amended) (Schedule 4 Criteria) can be found in Appendix E.

As indicated in the TCLP soils disposal letter and analytical results, the leachate concentrations in the soil sample were below the applicable Schedule 4 Criteria and the sample was not ignitable. Based on these findings, the PHC-impacted soil from the excavation was determined to be suitable for off-Site disposal as non-hazardous solid waste.

The laboratory Certificates of Analysis for the soil and groundwater samples are provided in Appendix D.

4.4 QA/QC Results

No laboratory instrumentation, shipping, chain of custody, breakage or temperature control issues were noted in the Certificate of Analysis provided by SGS that would suggest an invalidation of the analytical data.

All field instrumentation calibration checks were completed by TULLOCH field staff members prior to use on-Site. All field operations conducted by TULLOCH field staff members were completed using standard equipment decontamination and sampling procedures, and no deviations from the sampling plan were noted.

No field or laboratory QA/QC issues were identified with the respective sampling and lab analysis that would be expected to impact the quality of data and/or the conclusions presented in this report. Various quality assurance/quality control (QA/QC) protocols were followed during the assessment to ensure that representative samples were obtained, and that representative analytical data were reported by the laboratory.

Field sampling was completed in accordance with the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996 (MECP Sampling Guidelines).

Soil samples were submitted to SGS Laboratories, an independent Canadian Association for Analytical Laboratories (CALA) accredited laboratory facility. Chain of Custody forms were completed in the field for tracking purposes.

SGS's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries for the method blank, matrix spike and spiked blank samples.

4.5 Earthwork Volumes

The final measured arial extent of the excavation was approximately 750 m^2, with a maximum depth of approximately 2.5 mbgs. A total of approximately 700 metric tons of impacted soil were disposed of at the City of Sault Ste. Marie Landfill in Sault Ste. Marie, Ontario.

4.6 Groundwater

Groundwater was not encountered during or within the remedial soil excavation. Based on the water level of nearby St. Mary's River, it is anticipated that the groundwater level will be not far below the bedrock level of the bottom of the remedial excavation.

4.7 Backfilling

The City of Sault Ste. Marie Public Works Department performed backfilling and soil compaction activities subsequent to excavation operations. The excavation area was reportedly backfilled to grade with imported granular fill material from The City of Sault Ste. Marie's chosen gravel pit. TULLOCH was not retained to provide backfilling, compaction, or restoration supervision.

TULLOCH obtained one sample of the backfill for BTEX, PHC F1-F4, and lead analysis. The backfill sample met the Table 3 SCS for BTEX, PHCs (F1-F4) and lead.

5. CONCLUSIONS

The following is a summary of work completed during this VSSP:

- TULLOCH field personnel attended the Site between June 3 and July 15, 2021;
- One "worst-case" soil sample representative of the soil impacts was collected, and submitted for TCLP analysis;
- TULLOCH field personnel supervised and documented the removal of impacted soil through excavation, to complete a VSSP;
- Field observations made during the remedial excavation indicated the soil stratigraphy below surface consists of brown silty sand and gravel to the maximum depth of the excavation of 2.5 mbgs. Sandstone bedrock was encountered at 2.5 mbgs and groundwater was not encountered during this investigation;
- Based on Site specific information, the soil quality was assessed based on the MECP Table 3 SCS for coarse soil types and industrial/commercial/community property uses;

- The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for disposal of impacted soils. The impacted soil was transported by The City of Sault Ste. Marie Public Works Department to the City of Sault Ste. Marie Landfill Disposal Site, an MECP-approved facility licensed to accept solid non-hazardous waste, located in Sault Ste. Marie, Ontario;
- Based on the size of the remedial excavation, ten "worst-case" wall samples were collected from the final limits of the excavation, including one duplicate sample, as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the potential contaminants of concern: BTEX, PHCs (F1-F4), and lead; sandstone/bedrock was discovered at the base of the excavation (2.5 mbgs), therefore no floor samples were collected during the excavation.
- PHC odours were identified in the final soil limits along the base of the west and north walls. One soil sample with these PHC odours was collected (soil sample SS-040) and met the Table 3 SCS. Since the soil sample with the PHC odours met the Table 3 SCS, TULLOCH assumes that these impacts are mature and thus the PHC impacts have eroded over time, therefore the PHC impacts now meet Table 3 SCS.

The extents of the impacted soils have been removed from the Site up to the extent of the bedrock at 2.5 m or less, which is deemed to be practicable. The measurable BTEX and PHCs (F1-F4) soil concentrations from the remaining final limits of the excavation were below or undetectable compared to the applicable Table 3 Standards (see drawings in Appendix A); therefore all impacted soils were removed from the Site.

6. DISCLAIMER

The attached Verification Soil Sampling Program (Report) has been prepared by TULLOCH Inc. (Consultant) for the benefit of the Client in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (Agreement).

The information, data, recommendations, and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (Limitations);
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;

has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;

- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by Consultant and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (improper use of the Report), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

7. CLOSURE

We trust you will find the information presented acceptable and meets your requirements. If you have any questions, do not hesitate to contact the undersigned at your convenience.

Sincerely,
TULLOCH Inc.

Nicholas Conte
Environmental Technologist

Tyler Moody, A.Sc.T.
Project Manager

Cc: Robert Bressan, P.Eng., FEC
Environmental Engineer

APPENDIX A

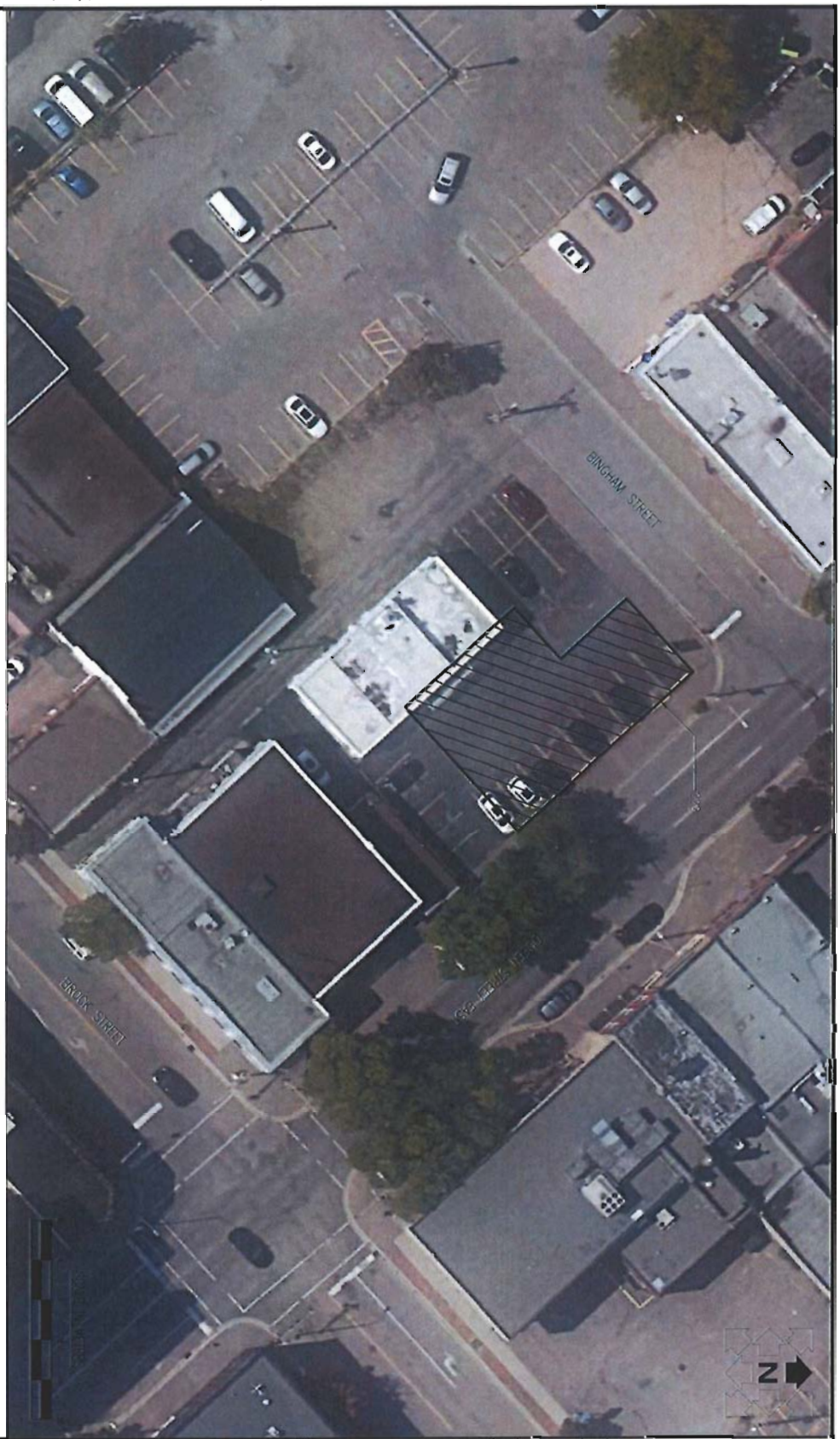
FIGURES

K:\2021\Engineering\211338 BrookMcRoy - 535 Queen St E\Drawings\21-1338 - 535 Queen Street - dec10.dwg

LEGEND

EXCAVATION AREA

EXCAVATION KEY PLAN



PROJECT:

SOIL REMEDIATION
535 QUEEN STREET EAST
SAULT STE. MARIE, ONTARIO

TULLOCH ENGINEERING

DRAWING:

EXCAVATION KEY PLAN

ENGINEER'S SEAL

No.	DATE	BY	ISSUES / REVISIONS
0	OCT. 15 2021	C.M	ISSUED FOR REPORT

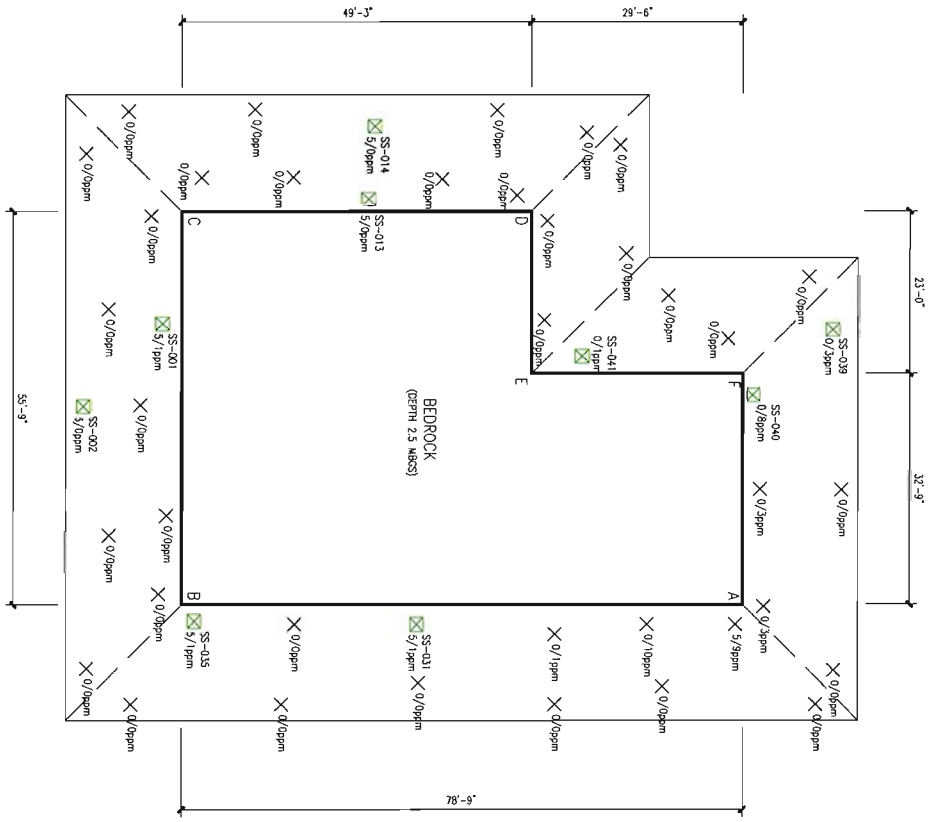
DRAWN BY:	CHECKED BY:	PROJECT No.:
C.M.	T.M.	21-1338
DESIGNED BY:	APPROVED BY:	DRAWING No. / REVISION No.
N.C.	T.M.	F1 / 0
SCALE:	DATE:	
N.T.S.	OCT. 14, 2021	

K:\2021\Engineering\211338 BrookMcIlroy - 535 Queen St E\Drawings\21-1338 - 535 Queen Street - dec10.dwg

LEGEND

- ⊠ SOIL SCREENING SAMPLE LOCATION
- ⊠ VERIFICATION SOIL SAMPLE LOCATION SUBMITTED FOR LABORATORY ANALYSIS
- (KEY/KEY) XXX PARTS PER MILLION
- MBGS METERS BELOW GROUND SURFACE

SAMPLE LOCATION PLAN



PROJECT:
SOIL REMEDIATION
535 QUEEN STREET EAST
SAULT STE. MARIE, ONTARIO

TULLOCH ENGINEERING

DRAWING:
SAMPLE LOCATION PLAN

ENGINEER'S SEAL

No.	DATE	BY	ISSUES / REVISIONS
0	OCT. 15. 2021	C.M.	ISSUED FOR REPORT

DRAWN BY:	CHECKED BY:	PROJECT No.:
C.M.	T.M.	21-1338
DESIGNED BY:	APPROVED BY:	DRAWING No. / REVISION No.
N.C.	T.M.	F2 / 0
SCALE:	DATE:	
N.T.S.	OCT. 14. 2021	

APPENDIX B

SITE PHOTOGRAPHS

Photo 1 – View of the remedial excavation, looking west.

Photo 2 – View of the remedial excavation, looking north.

Photo 3 – View of the active remedial excavation removing soils from western portion of the excavation, looking west.

Photo 4 – View of the active remedial excavation while continuing to dig westwards, looking west.

APPENDIX C

SUMMARY TABLES

TULLOCH

TABLE 1 - SOIL ANALYTICAL RESULTS
Soil Remediation VSSP
535 Queen Street East, Sault Ste. Marie, Ontario

SAMPLE ID		SS-001	SS-002	SS-013	SS-014	SS-31	SS-035	STANDARDS, CRITERIA & OBJECTIVES
Date Sampled (mm/dd/yyyy)		9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	
Laboratory Sample #		8	9	10	11	12	13	
Sample Location		Wall	Wall	Wall	Wall	Wall	Wall	
Sample Depth (mbg[1])		2.3	0.5	2.3	0.8	2.0	2.3	
Combustible Organic Vapor Reading[2]		5/1 ppm	5/0 ppm	5/0 ppm	5/0 ppm	5/1 ppm	5/1 ppm	
Sample Visual Observation		Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	
PARAMETER	**Units**							**MECP Table 3 SCS[3]**
Volatile Organic Compounds								
Benzene	µg/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.32
Toluene	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	68
Ethylbenzene	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	9.5
Xylene Mixture	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	26
PHC Fractions F1 to F4								
F1 (C6-C10) - Less BTEX[5]	µg/g	<10	<10	<10	<10	<10	<10	55
F2 (C10-C16)	µg/g	<10	<10	<10	<10	<10	<10	230
F3 (C16-C34)	µg/g	<50	<50	<50	<50	<50	<50	1700
F4 (C34-C50)	µg/g	<50	<50	<50	<50	<50	<50	3300
Lead	µg/g	1.7	20	1.8	2	26	1.8	120

[1]All sample depths are recorded as "metres below grade".

[2]Headspace measured with RKI Eagle Catalytical Combustion Monitor. Results reported in "parts per million" or "% lower explosive limit" (HEX/ISO).

[3]MECP Standard- "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15th, 2011, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Industrial/Commercial/Community Land Use.

[4]Total Xylene values are given as the sum of the m+p-Xylene and o-Xylene values.

[8]F1 values represent the results for the C6 - C10 hydrocarbon fraction, with the BTEX results subtracted.

INSF means insufficient sample available to conduct a COV measurement.

Shaded Cells - Result exceeds MECP Table 3 SCS.

Checked By: Tyler Moody / Rob Bressan

TULLOCH Project 21-1338

TULLOCH

TABLE 1 - SOIL ANALYTICAL RESULTS
Soil Remediation VSSP
535 Queen Street East, Sault Ste. Marie, Ontario

SAMPLE ID		SS-039	SS-040	SS-041	Backfill	DUP-1		STANDARDS, CRITERIA & OBJECTIVES
Date Sampled (mm/dd/yyyy)		15/07/2021	15/07/2021	15/07/2021	15/07/2021	9/7/2021		
Laboratory Sample #		8	9	10	11	14		
Sample Location		Wall	Wall	Wall	Wall	SS-035		
Sample Depth (mbg[1])		0.8	2.3	2.3	Surface	2.3		
Combustible Organic Vapor Reading[2]		0/3 ppm	0/8 ppm	0/1 ppm	0/0 ppm	5/1 ppm		
Sample Visual Observation		Brown silty sand and gravel. No odours.	Brown silty sand and gravel. PHC odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.	Brown silty sand and gravel. No odours.		
PARAMETER	**Units**							**MECP Table 3 SCS[3]**
Volatile Organic Compounds								
Benzene	µg/g	<0.02	<0.02	<0.02	<0.02	<0.02		0.32
Toluene	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05		68
Ethylbenzene	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05		9.5
Xylene Mixture	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05		26
PHC Fractions F1 to F4								
F1 (C6-C10) - Less BTEX[5]	µg/g	<10	<10	<10	<10	<10		55
F2 (C10-C16)	µg/g	<10	<10	<10	<10	<10		230
F3 (C16-C34)	µg/g	<50	<50	<50	<50	<50		1700
F4 (C34-C50)	µg/g	<50	64	<50	<50	<50		3300
Lead	µg/g	12	78	2.7	6.9	1.7		120

[1]All sample depths are recorded as "metres below grade".

[2]Headspace measured with RKI Eagle Catalytical Combustion Monitor. Results reported in "parts per million" or "% lower explosive limit" (HEX/ISO).

[3]MECP Standard- "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15th, 2011, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition, Industrial/Commercial/Community Land Use.

[4]Total Xylene values are given as the sum of the m+p-Xylene and o-Xylene values.

[8]F1 values represent the results for the C6 - C10 hydrocarbon fraction, with the BTEX results subtracted.

INSF means insufficient sample available to conduct a COV measurement.

Shaded Cells - Result exceeds MECP Table 3 SCS.

Checked By: Tyler Moody / Rob Bressan

TULLOCH Project 21-1338

APPENDIX D

LABORATORY CERTIFICATES OF ANALYSIS

FINAL REPORT

CA14928-JUL21 R1

21-1338

Prepared for

Tulloch Engineering

FINAL REPORT

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Tulloch Engineering	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	71 Black Road, Unit 8 Sault Ste. Marie, ON P6B 0A3. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Nick Conte	Telephone	705-652-2143
Telephone	705-949-1457	Facsimile	705-652-6365
Facsimile		Email	brad.moore@sgs.com
Email	nicholas.conte@tulloch.ca;tyler.moody@tulloch.ca	SGS Reference	CA14928-JUL21
Project	21-1338	Received	07/10/2021
Order Number		Approved	07/14/2021
Samples	Soil (7)	Report Number	CA14928-JUL21 R1
		Date Reported	07/14/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

- nC6 and nC10 response factors within 30% of response factor for toluene: YES
- nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES
- C50 response factors within 70% of nC10 + nC16 + nC34 average: YES
- Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:011684

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1
Index..... 2
Results..... 3-4
Exceedance Summary..... 5
QC Summary..... 6-8
Legend..... 9
Annexes..... 10

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

				Sample Number	8	9	10	11	12	13	14		
				Sample Name	SS-001	SS-002	SS-013	SS-014	SS-31	SS-035	DUP-1		
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
				Sample Date	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021		
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**		
BTEX													
Benzene	µg/g	0.02	0.4		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02		
Ethylbenzene	µg/g	0.05	19		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Toluene	µg/g	0.05	78		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Xylene (total)	µg/g	0.05	30		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
m/p-xylene	µg/g	0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
o-xylene	µg/g	0.05			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

				Sample Number	8	9	10	11	12	13	14		
				Sample Name	SS-001	SS-002	SS-013	SS-014	SS-31	SS-035	DUP-1		
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
				Sample Date	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021		
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**		
Metals and Inorganics													
Moisture Content	%	-			22.1	18.3	22.4	15.8	14.3	20.2	20.0		
Lead	µg/g	0.1	120		1.7	20	1.8	2.0	26	1.8	1.7		

Client: Tulloch Engineering
Project: 21-1338
Project Manager: Nick Conte
Samplers: Nick Conte

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

				Sample Number	8	9	10	11	12	13	14
				Sample Name	SS-001	SS-002	SS-013	SS-014	SS-31	SS-035	DUP-1
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021
Parameter	**Units**	**RL**	**L1**		**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PHCs											
F1 (C6-C10)	µg/g	10	65		< 10	< 10	< 10	< 10	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10			< 10	< 10	< 10	< 10	< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	250		< 10	< 10	< 10	< 10	< 10	< 10	< 10
F3 (C16-C34)	µg/g	50	2500		< 50	< 50	< 50	< 50	< 50	< 50	< 50
F4 (C34-C50)	µg/g	50	6600		< 50	< 50	< 50	< 50	< 50	< 50	< 50
Chromatogram returned to baseline at nC50	Yes / No	-			YES	YES	YES	YES	YES	YES	YES

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Lead	EMS0051-JUL21	µg/g	0.1	<0.1	3	20	102	70	130	95	70	130

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F1 (C6-C10)	GCM0201-JUL21	µg/g	10	<10	ND	30	96	80	120	110	60	140

QC SUMMARY

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F2 (C10-C16)	GCM0226-JUL21	µg/g	10	<10	ND	30	95	80	120	96	60	140
F3 (C16-C34)	GCM0226-JUL21	µg/g	50	<50	ND	30	95	80	120	96	60	140
F4 (C34-C50)	GCM0226-JUL21	µg/g	50	<50	ND	30	95	80	120	96	60	140

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Benzene	GCM0201-JUL21	µg/g	0.02	<0.02	ND	50	68	60	130	82	50	140
Ethylbenzene	GCM0201-JUL21	µg/g	0.05	<0.05	ND	50	73	60	130	85	50	140
m/p-xylene	GCM0201-JUL21	µg/g	0.05	<0.05	ND	50	75	60	130	88	50	140
o-xylene	GCM0201-JUL21	µg/g	0.05	<0.05	ND	50	72	60	130	85	50	140
Toluene	GCM0201-JUL21	µg/g	0.05	<0.05	ND	50	70	60	130	82	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 011684 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Hillary N
Received Date: 07/10/21 (mm/dd/yy)
Received Time: 14:00 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type:
Temperature Upon Receipt (°C) 9.9.9
LAB LIMS #: CA14928-JUL21

REPORT INFORMATION	INVOICE INFORMATION
Company: Tulloch Eng.	☒ (same as Report Information)
Contact: Nicholas Conte	Company:
Address: 71 Black Rd, Sault Ste Marie, ON	Contact:
Phone: 705-975-0913	Address:
Fax:	Phone:
Email: nicholas.conte@tulloch.ca tyler.moody@tulloch.ca	Email:

Quotation #:
Project #: SB 21-1338
P.O. #:
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☐ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☒ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Table 2 ☒ Ind/Com ☒ Table 3 ☐ Agri/Other ☐ Table ____ Soil Texture: ☐ Coarse ☒ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

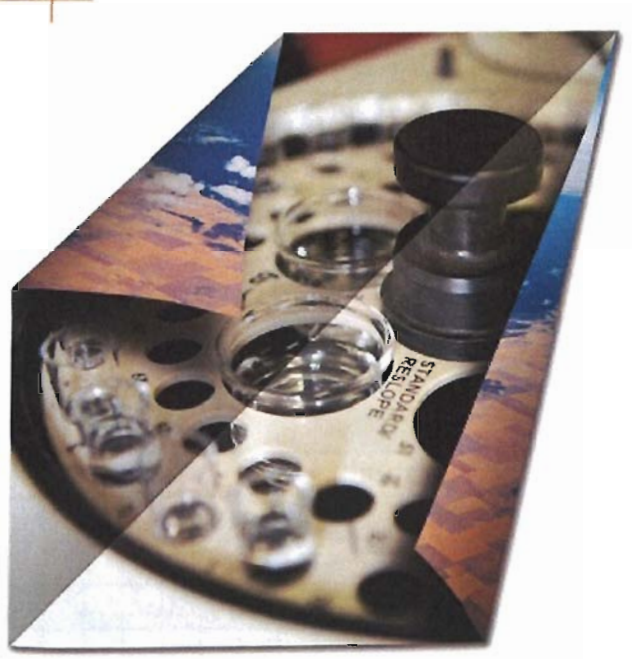
	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg, pH, B(HWS), EC, SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only), Hg, CrVI)	M&I: ICP Metals only (Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Se, Ag, Tl, U, V, Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other: Cond (µS)	Other: Sewer Use: (Specify pkg:)	Other: Water Characterization Pkg (General ☐ Extended ☐)	TCLP (Specify TCLP tests ☐M&I ☐VOC ☐PCB ☐B(a)P ☐ABN ☐Ignit.)	COMMENTS:
1	SS-001	July 9	11:00	4	S								X					X				
2	SS-002												X					X				
3	SS-013												X					X				
4	SS-014												X					X				
5	SS-31												X					X				
6	SS-035												X					X				
7	DUP-1												X					X				
8																						
9																						
10																						
11																						
12																						

Observations/Comments/Special Instructions

Sampled By (NAME): Nick Conte	Signature:	Date: July 9, 2021 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Nick Conte	Signature:	Date: July 9, 2021 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.2
Date of Issue: 09 Sept. 2019

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.



FINAL REPORT

CA15252-JUL21 R

21-1338

Prepared for

Tulloch Engineering

FINAL REPORT

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Tulloch Engineering	Project Specialist	Jill Campbell, B.Sc.,GISAS
		Laboratory	SGS Canada Inc.
Address	71 Black Road, Unit 8 Sault Ste. Marie, ON P6B 0A3. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Nick Conte	Telephone	2165
Telephone	705-949-1457	Facsimile	705-652-6365
Facsimile		Email	jill.campbell@sgs.com
Email	nicholas.conte@tulloch.ca;tyler.moody@tulloch.ca	SGS Reference	CA15252-JUL21
Project	21-1338	Received	07/16/2021
Order Number		Approved	07/21/2021
Samples	Soil (4)	Report Number	CA15252-JUL21 R
		Date Reported	07/21/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

- nC6 and nC10 response factors within 30% of response factor for toluene: YES
- nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES
- C50 response factors within 70% of nC10 + nC16 + nC34 average: YES
- Linearity is within 15%: YES

Hydrocarbon results are expressed on a dry weight basis.

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:No

Chain of Custody Number:011685

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

First Page..... 1-2

Index..... 3

Results..... 4-5

Exceedance Summary..... 6

QC Summary..... 7-9

Legend..... 10

Annexes..... 11

Client: Tulloch Engineering
Project: 21-1338
Project Manager: Nick Conte
Samplers: Nick Conte

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				8	9	10	11
Sample Name				SS-039	SS-040	SS-041	Backfill
Sample Matrix				Soil	Soil	Soil	Soil
Sample Date				15/07/2021	15/07/2021	15/07/2021	15/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
BTEX							
Benzene	µg/g	0.02	0.4	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	19	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	µg/g	0.05	78	< 0.05	< 0.05	< 0.05	< 0.05
Xylene (total)	µg/g	0.05	30	< 0.05	< 0.05	< 0.05	< 0.05
m/p-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05
o-xylene	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				8	9	10	11
Sample Name				SS-039	SS-040	SS-041	Backfill
Sample Matrix				Soil	Soil	Soil	Soil
Sample Date				15/07/2021	15/07/2021	15/07/2021	15/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics							
Moisture Content	%	-		16.1	15.6	21.7	4.3
Lead	µg/g	0.1	120	12	78	2.7	6.9

Client: Tulloch Engineering
Project: 21-1338
Project Manager: Nick Conte
Samplers: Nick Conte

PACKAGE: **REG153 - PHCs** (SOIL)

L1 = REG153 / SOIL / FINE - TABLE 3 - Industrial/Commercial - UNDEFINED

Sample Number				8	9	10	11
Sample Name				SS-039	SS-040	SS-041	Backfill
Sample Matrix				Soil	Soil	Soil	Soil
Sample Date				15/07/2021	15/07/2021	15/07/2021	15/07/2021
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**
PHCs							
F1 (C6-C10)	µg/g	10	65	< 10	< 10	< 10	< 10
F1-BTEX (C6-C10)	µg/g	10		< 10	< 10	< 10	< 10
F2 (C10-C16)	µg/g	10	250	< 10	< 10	< 10	< 10
F3 (C16-C34)	µg/g	50	2500	< 50	< 50	< 50	< 50
F4 (C34-C50)	µg/g	50	6600	< 50	64	< 50	< 50
Chromatogram returned to baseline at nC50	Yes / No	-		YES	YES	YES	YES

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Lead	EMS0083-JUL21	µg/g	0.1	<0.1	2	20	110	70	130	96	70	130

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F1 (C6-C10)	GCM0331-JUL21	µg/g	10	<10	ND	30	95	80	120	100	60	140

QC SUMMARY

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F2 (C10-C16)	GCM0345-JUL21	µg/g	10	<10	ND	30	111	80	120	103	60	140
F3 (C16-C34)	GCM0345-JUL21	µg/g	50	<50	ND	30	111	80	120	103	60	140
F4 (C34-C50)	GCM0345-JUL21	µg/g	50	<50	ND	30	111	80	120	103	60	140

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Benzene	GCM0331-JUL21	µg/g	0.02	<0.02	ND	50	85	60	130	96	50	140
Ethylbenzene	GCM0331-JUL21	µg/g	0.05	<0.05	ND	50	81	60	130	92	50	140
m/p-xylene	GCM0331-JUL21	µg/g	0.05	<0.05	ND	50	85	60	130	99	50	140
o-xylene	GCM0331-JUL21	µg/g	0.05	<0.05	ND	50	80	60	130	93	50	140
Toluene	GCM0331-JUL21	µg/g	0.05	<0.05	ND	50	81	60	130	94	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 011685 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Mark Rippey
Received Date: JUL 16 2021 (mm/dd/yy)
Received Time: 09 : 30 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☐ No ☒
Custody Seal Intact: Yes ☐ No ☒
Cooling Agent Present: Yes ☒ No ☐ Type: Ice
Temperature Upon Receipt (°C) 9.9 C
LAB LIMS #: CA-15252-JUL21

REPORT INFORMATION	INVOICE INFORMATION
Company: Tullah Engineering	~~☐~~ (same as Report Information)
Contact: Nicole Conte	Company:
Address: 71 Black Rd	Contact:
Sault Ste. Marie, ON	Address:
Phone: 705-975-0413	Phone:
Fax:	Email:
Email: nicholas.conte@tullah.ca	

Quotation #: P.O. #:
Project #: 21-1338 Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☐ Regular TAT (5-7days)

TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☒ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Table 2 ☒ Ind/Com ☒ Table 3 ☐ Agri/Other ☐ Table ____ Soil Texture: ☐ Coarse ☒ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	SS-039	July 15	12:00	3	S
2	SS-040		12:05	4	S
3	SS-041		12:10	4	S
4	~~SS-~~ Bench Sill		12:15	4	S
5					
6					
7					
8					
9					
10					
11					
12					

	M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)							TCLP	COMMENTS:
	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg pH (B(HWS), EC, SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni, Se,Ag,Tl,U,V,Zn	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs Total ☐ Aroclor ☐	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all Incl BTEX	BTEX only	Pesticides Organochlorine or specify other	Lead (Pb)					Sewer Use: Specify pkg:	Water Characterization Pkg ☐ General ☐ Extended	Specify TCLP tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit	
1								X					X								
2								X					X								
3								X					X								
4								X					X								

Observations/Comments/Special Instructions

Sampled By (NAME): Nicole Conte Signature: Date: July 15, 2021 (mm/dd/yy) Pink Copy - Client

Relinquished by (NAME): Nicole Conte Signature: Date: July 15, 2021 (mm/dd/yy) Yellow & White Copy - SGS

Revision #: 1.2
Date of Issue: 09 Sept. 2019

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. (2) Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). (3) Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

3929896 Ja 601

APPENDIX E

TCLP LETTER

City of Sault Ste Marie - Waste Management Division

Soil Acceptance Application Form

The City of Sault Ste Marie Waste Management Facility accepts contaminated soils for daily cover or disposal, only after the results of lab analysis of the soil have been approved by City Staff. This soil acceptance application form is required to initiate the review process.

Please complete the application form and forward it along with supporting documents to:

Waste Management Division
City of Sault Ste Marie
128 Sackville Rd
Sault Ste Marie, ON P6B 4T5
Fax Number: (705) 759-5219

For further information, please contact Mike Blanchard at (705) 541-7087 or m.blanchard@cityssm.on.ca

Section A – Contact Information

Company Name: TULLOCH Engineering Inc.

Contact Person: Tyler Moody, A.Sc.T.

Address: 71 Black Road

Telephone: 705-949-1457 (Cell – 705-257-9600)

Fax: NA

Email: Tyler.moody@tulloch.ca

Submitted by:

Print Name: Tyler Moody, A.Sc.T.

Signature:

Date: 15/06/2021

Section B – Site Information

Source of Material Address: 535 Queen Street East

Current Land Use: Vacant commercial land

Historic Land Use: Commercial land (former office building and service station).

Section C – Material Information

Estimated Volume (tonne): Exact quantities are unknown. Estimated to be between 350-500 cubic metres

Source of Contamination: Gasoline from historical fuel dispensing activities on Site.

Specific Material Characteristics (soil type, porosity, particle size, etc.):

Silty sand, sandstone till

Comments: Soils require removal from the Site due to construction of the downtown plaza

Section D – Chemical Acceptance Criteria

Appropriate Report of Analysis must be submitted with this application form, along with site and sample location plans. Chemical analysis must be sufficient in quantity and scope to represent all the material to be disposed of and all of the suspected contaminants. Analysis and criteria should be listed side by side, and any parameters in excess of the guidelines highlighted. A cover letter from the appropriate test facility/laboratory or engineering firm must accompany the test results and must indicate that the soil is non-hazardous as specified in Regulation 347 (as amended from time to time) and O.Reg. 558, Schedule 4 TCLP Leachate Criteria.

1. **For Use as Daily Cover:**
   - Soil must be granular in nature and not contain clay, mud or debris.

2. **For Disposal as Waste: ($70/tonne as per Waste Management By-law 2003-140)**
   - This material due to its composition cannot be used for daily cover.

Intended Use of Contaminated Material:

Daily Cover	x	**Disposal**	

Disclaimer: The City of Sault Ste Marie reserves the right to reject an application/load (even if soil criteria are met) in order to protect leachate quality, address landfill capacity concerns, to comply with Certificate of Approval limitations and other regulations, etc.

For Office Use Only:

Accepted Direction:	Daily Cover		Disposal		Stock Pile (Clay)		Denied	

WM Staff Approval: _____ Date: _____

Copy to: Deputy Commissioner of PWT

TULLOCH
ENGINEERING

71 Black Road
Unit 8
Sault Ste. Marie,
ON
P6B 0A3

T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602

saultstemarie@TULLOCH.ca

June 15, 2021
21-1338

Mr. Mike Blanchard
Manager, Waste Management and Refuse
City of Sault Ste. Marie Public Works
128 Sackville Road
Sault Ste. Marie, Ontario
P6B 4T6

Attention: Mr. Mike Blanchard

Re: Analytical Results - Toxicity Characteristic Leachate Procedure (TCLP)
535 Queen Street, Sault Ste. Marie, Ontario

Dear Mr. Blanchard,

TULLOCH Engineering (TULLOCH) was retained by Brook McIlroy (Client) to determine disposal options for petroleum hydrocarbon (PHC) impacted soil removed during the soil remediation at 535 Queen Street East in Sault Ste. Marie, Ontario (herein referred to as the 'Site').

Samples of worse case soils were collected during a test pit program at the Site, in May 2021. Soil samples were collected from 2.0 and 2.5 metres below ground surface (mbgs), consisting of native silty sand glacial till. A composite sample was sent for analysis to classify the soils under Ontario Regulation 347 as amended to Ontario Regulation 558/00. The sample was submitted for laboratory analysis via the Toxicity Characteristic Leachate Procedure (TCLP) to determine whether the waste material is considered a "leachate toxic waste" in accordance with the regulation. Selected parameters for analysis (PCB, Metals, VOC, PAH and Ignitability) were chosen because of their potential presence based on the historical use of the Site.

The soil sample (TP4 7' + TP4B 8') was relinquished to Testmark Laboratories Ltd. (Testmark). Testmark is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the International Standards ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories.

TULLOCH compared the results of Testmark's analytical report, number 428782, with the corresponding allowable concentration as prescribed by the Schedule 4 Leachate Quality Criteria, established by Ontario Regulation 558/00. The following table illustrates the TCLP results in comparison with the Schedule 4 Leachate Quality Criteria.

Parameter	Units	MDL[1]	Results	Schedule 4 Criteria[2]
Metals				
Arsenic	ug/L	10	<10	2500
Barium	ug/L	10	140	100000
Boron	ug/L	20	378	500000
Cadmium	ug/L	1	<1	500
Chromium	ug/L	10	23	5000
Lead	ug/L	1	82	5000
Mercury	ug/L	1	<1	100
Selenium	ug/L	2	<2	1000
Silver	ug/L	1	<1	5000
Uranium	ug/L	10	<10	10000
Volatile Organic Compounds				
Vinyl Chloride	ug/L	1	<1	200
1,1 Dichloroethylene	ug/L	3	<3	1400
Dichloromethane	ug/L	20	<20	5000
Methyl Ethyl Ketone	ug/L	50	<50	200000
Chloroform	ug/L	3	<3	10000
1,2-Dichloroethane	ug/L	3	<3	500
Carbon Tetrachloride	ug/L	2	<2	500
Benzene	ug/L	1	<1	500
Trichloroethylene	ug/L	2	<2	5000
Tetrachloroethylene	ug/L	3	<3	3000
Chlorobenzene	ug/L	5	<5	8000
1,2-Dichlorobenzene	ug/L	3	<3	20000
1,4-Dichlorobenzene	ug/L	3	<3	500
Benzo(a)pyrene				
Benzo-a-pyrene	ug/L	0.01	<0.01	1.0
Ignitability				
Ignitability	N/A	N/A	Non Flammable	N/A
Particle Size				
Particle Size (Description)	N/A	N/A	Sandy Clay	N/A
PCBs				
PCBs	ug/L	0.05	<0.05	300

NOTES:

[1]RDL means Reportable Detection Limit.

[2]Leachate Quality Criteria are prescribed by Schedule 4 of Ontario Regulation 558/00, Regulation (Amended O. Reg. 347), made under the Environmental Protection Act, dated March 31, 2001.

[3]The sum of Nitrate and Nitrite (as Nitrogen) cannot exceed 1,000 mg/L.

Shaded Cells – Represent results that exceed the Schedule 4 Leachate Quality Criteria.

Based on the analytical results, the soil sample meets the current Schedule 4 Leachate Quality Criteria and is **not** considered "leachate toxic waste". Therefore, the soil is classified as a **solid non-hazardous**

industrial waste, which is considered acceptable for disposal at an Ontario Ministry of Environment and Climate Change registered waste disposal site.

At this time the exact quantity of soil to be excavated is unknown but is estimated to be between 350m^3 to 500m^3.

TULLOCH trusts the above information is complete and satisfactory for your requirements at this time; however, should you have any questions regarding the information provided, please call the undersigned directly at (705) 257-9600

Sincerely,
TULLOCH Engineering Inc.

Tyler Moody, A.Sc.T.
Project Manager
tyler.moody@tulloch.ca

Enclosed: Testmark Laboratories Ltd. Analytical report 428782

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Client:	Rod Morrison	Work Order Number:	428782
Company:	Tulloch Engineering-Sault Ste. Marie	PO #:	
Address:	71 Black Road Sault Ste. Marie, ON, P6B 0A3	Regulation: Project #:	O.Reg 153 Table 7 Soil Stringent Criteria 21-1156
Phone/Fax:	(705) 949-1457 / (705) 949-9606	DWS #:	
Email:	rod.morrison@tulloch.ca	Sampled By:	Rod Morrison
Date Order Received:	4/30/2021	Analysis Started:	5/5/2021
Arrival Temperature:	13 °C	Analysis Completed:	6/11/2021

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
TP2 6'	1637596	Soil	None		4/28/2021	
TP3 8'	1637597	Soil	None		4/28/2021	
TP4 7'	1637598	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	4/28/2021	
TP4B 8'	1637599	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	4/28/2021	
TP5 4'	1637600	Soil	None		4/28/2021	
TP6 8'	1637601	Soil	None		4/28/2021	
DUP-1	1637602	Soil	None		4/28/2021	
TP4 7' + TP4B 8'	1650078	Soil	None			
TP4 7' + TP4B 8' LEACHATE	1650079	Leachate	None			

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
BTEX/F1 Soil (A127)	Garson	Determination of PHC BTEX/F1 in Soil - Tier 1 CCME	Modified from CWS PHC Tier I CCME
ICPMS Reg. Water (A13)	Garson	Determination of Metals in Water by ICP/MS	Modified from SW846-6020A
Ignite (R99)	Garson	Determination of Ignitability of Soil	Modified from EPA 1030

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In-House
PAH Water SIM (A41)	Garson	Determination of PAH in Water by GC/MS	Modified from SW846-8270D
PAH+ Soil SIM (A41)	Garson	Determination of PAH in Soil by GC/MS	Modified from SW846-8270D
PCBs Water (A19)	Garson	Determination of Polychlorinated Biphenyls in Water by GC/ECD	Modified from SW846-8082-A
PHC F2-F4 Soil (A59)	Garson	Determination of PHC (F2-F4) in Soil - Tier 1 CCME by GC/FID	Modified from CWS PHC Tier I CCME
PHC F2-F4 Soil - PAH (A59)	Garson	Calculation of PHC F2-F4 With PAHs Subtracted	Modified from CWS PHC Tier I CCME
TCLP Zero Headspace Leachate Extraction (A99)	Garson	TCLP Leachate Extraction of Soils	EPA Method 1311
VOC Water (A14)	Garson	Determination of Volatile Organic Compounds in Water by P&T/GC/MS	Modified from EPA 624

REPORT COMMENTS

Report revised to add sample 1650078 (TP4 7' + TP4B 8') and 16570079 (TP4 7' + TP4B 8' Leachate) and process them for additional parameters, as per clients request. 06/14/21 KJM

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

WORK ORDER RESULTS

Sample Description	TP2 6'		TP3 8'		TP4 7'		TP4B 8'			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637596		1637597		1637598		1637599			
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	**Criteria: O.Reg 153 Table 7 Soil Stringent Criteria**
% Moisture	19.1	0.1	19.7	0.1	20.9	0.1	22.1	0.1	%	~

Sample Description	TP5 4'		TP6 8'		DUP - 1			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637600		1637601		1637602			
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	**Criteria: O.Reg 153 Table 7 Soil Stringent Criteria**
% Moisture	20.7	0.1	15.2	0.1	20.4	0.1	%	~

Sample Description	TP4 7' + TP4B 8'			
Sample Date	[Not Provided]			
Lab ID	1650078			
Industrial Analyses	**Result**	**MDL**	**Units**	**Criteria: O.Reg 153 Table 7 Soil Stringent Criteria**
Burn Rate	N/A	N/A	NA	~
Ignitability	No	N/A	NA	~
Particle Size (Description)	SandyClay	N/A	NA	~

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP4 7' + TP4B 8' LEACHATE
Sample Date	[Not Provided]
Lab ID	1650079

Metals	Result	MDL	Units	Criteria: O.Reg. 558
Arsenic	<10 [<10]	10	ug/L	2500
Barium	140 [136]	10	ug/L	100000
Boron	378 [345]	20	ug/L	500000
Cadmium	<1 [<1]	1	ug/L	500
Chromium	23 [23]	10	ug/L	5000
Lead	82 [85]	1	ug/L	5000
Mercury	<1 [<1]	1	ug/L	100
Selenium	<2 [<2]	2	ug/L	1000
Silver	<1 [<1]	1	ug/L	5000
Uranium	<10 [<10]	10	ug/L	10000

Sample Description	TP2 6'
Sample Date	4/28/2021 12:00 AM
Lab ID	1637596

PAH	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
1+2-Methylnaphthalene (Calc.)	<0.01 [<0.02]	0.01	µg/g	0.99
Acenaphthene	<0.009 [<0.01]	0.009	µg/g	7.9

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP2 6'
Sample Date	4/28/2021 12:00 AM
Lab ID	1637596

PAH	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
Acenaphthylene	<0.009 [<0.01]	0.009	µg/g	0.15
Anthracene	<0.009 [<0.01]	0.009	µg/g	0.67
Benzo(a)anthracene	<0.009 [<0.01]	0.009	µg/g	0.5
Benzo(a)pyrene	<0.009 [<0.01]	0.009	µg/g	0.3
Benzo(b)fluoranthene	<0.009 [<0.01]	0.009	µg/g	0.78
Benzo(ghi)perylene	<0.009 [<0.01]	0.009	µg/g	6.6
Benzo(k)fluoranthene	<0.009 [<0.01]	0.009	µg/g	0.78
Chrysene	<0.009 [<0.01]	0.009	µg/g	7
Dibenz(a,h)anthracene	<0.009 [<0.01]	0.009	µg/g	0.1
Fluoranthene	<0.009 [<0.01]	0.009	µg/g	0.69
Fluorene	<0.009 [<0.01]	0.009	µg/g	62
Indeno(1,2,3-c,d)pyrene	<0.009 [<0.01]	0.009	µg/g	0.38
Naphthalene	<0.009 [<0.01]	0.009	µg/g	0.6
Phenanthrene	<0.009 [<0.01]	0.009	µg/g	6.2
Pyrene	<0.009 [<0.01]	0.009	µg/g	78

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP4 7' + TP4B 8' LEACHATE
Sample Date	[Not Provided]
Lab ID	1650079

PAH	Result	MDL	Units	Criteria: O.Reg. 558
Benzo(a)pyrene	<0.01	0.01	ug/L	1

Sample Description	TP4 7' + TP4B 8' LEACHATE
Sample Date	[Not Provided]
Lab ID	1650079

PCBs	Result	MDL	Units	Criteria: O.Reg. 558
Decachlorobiphenyl (Surr.)	109	N/A	% Rec	~
Total PCBs	<0.05	0.05	ug/L	300

Sample Description	TP2 6'		TP3 8'		TP4 7'		TP4B 8'			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637596		1637597		1637598		1637599			
Petroleum Hydrocarbons (Soil)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
F1 (C6-C10) - Less BTEX (Calc.)	<3 [<3]	3	<2	2	2180	3	684	2	µg/g	55
F1 (C6-C10) Incl. BTEX	<3 [<3]	3	<2	2	2770	70	863	2	µg/g	~
F2 (C10-C16)	19 [29]	6	15	4	625	5	238	5	µg/g	98
F2 (C10-C16)-Napth (Calc.)	19	2							µg/g	~
F3 (C16-C34)	17 [<20]	10	11	10	43	10	36	10	µg/g	300
F3 (C16-C34)-PAH (Calc.)	17	4							µg/g	~
F4 (C34-C50)	<20 [<20]	20	<10	10	<20	20	<20	20	µg/g	2800

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP2 6'		TP3 8'		TP4 7'		TP4B 8'			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637596		1637597		1637598		1637599			
Petroleum Hydrocarbons (Soil)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
F4 (C34-C50) (Calc.)	<6	6							µg/g	2800
Baseline @ C50	Yes [Yes]	N/A	Yes	N/A	Yes	N/A	Yes	N/A	NA	~
Benzene	<0.01 [<0.01]	0.01	<0.009	0.009	0.02	0.01	0.020	0.007	µg/g	0.17
Ethylbenzene	<0.02 [<0.02]	0.02	<0.02	0.02	76.6	0.5	11.90	0.01	µg/g	2
Toluene	<0.03 [<0.03]	0.03	<0.03	0.03	26.00	0.03	4.92	0.02	µg/g	2.3
m+p-Xylene	0.03 [0.03]	0.02	0.02	0.02	361.0	0.5	121.0	0.1	µg/g	~
o-Xylene	<0.03 [<0.03]	0.03	<0.02	0.02	152.0	0.7	59.0	0.2	µg/g	~
Total Xylenes (Calc.)	0.03 [<0.03]	0.03	<0.03	0.03	2.84	0.03	162.00	0.02	µg/g	3.1
1,4-dichlorobenzene-d4 (Surr.)	93.6 [91.5]	N/A	93.5	N/A	101	N/A	95.7	N/A	% Rec	~
o-Terphenyl (Surr.)	64.4 [64]	N/A	67.2	N/A	90.8	N/A	83.6	N/A	% Rec	~
undecane (Surr.)	109 [111]	N/A	109	N/A	114	N/A	104	N/A	% Rec	~
1,2-dichlorobenzene-d4 (Surr.)	86.8 [81.1]	N/A	81.9	N/A	97.4	N/A	87.8	N/A	% Rec	~

Sample Description	TP5 4'		TP6 8'		DUP - 1			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637600		1637601		1637602			
Petroleum Hydrocarbons (Soil)	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
F1 (C6-C10) - Less BTEX (Calc.)	<3	3	<2	2	<3	3	µg/g	55

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP5 4'		TP6 8'		DUP - 1			
Sample Date	4/28/2021 12:00 AM		4/28/2021 12:00 AM		4/28/2021 12:00 AM			
Lab ID	1637600		1637601		1637602			
Petroleum Hydrocarbons (Soil)	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 7 Soil Stringent Criteria
F1 (C6-C10) Incl. BTEX	3	3	2	2	<3	3	µg/g	~
F2 (C10-C16)	26	5	14	4	14	4	µg/g	98
F3 (C16-C34)	122	10	9	9	10	9	µg/g	300
F4 (C34-C50)	52	10	<10	10	<10	10	µg/g	2800
Baseline @ C50	Yes	N/A	Yes	N/A	Yes	N/A	NA	~
Benzene	<0.01	0.01	<0.007	0.007	<0.01	0.01	µg/g	0.17
Ethylbenzene	0.07	0.02	0.04	0.01	<0.02	0.02	µg/g	2
Toluene	0.04	0.03	0.03	0.02	<0.03	0.03	µg/g	2.3
m+p-Xylene	0.53	0.02	0.19	0.01	0.05	0.02	µg/g	~
o-Xylene	0.28	0.03	0.09	0.02	<0.03	0.03	µg/g	~
Total Xylenes (Calc.)	0.81	0.03	0.28	0.02	0.05	0.03	µg/g	3.1
1,4-dichlorobenzene-d4 (Surr.)	91.6	N/A	93.5	N/A	97	N/A	% Rec	~
o-Terphenyl (Surr.)	85.5	N/A	64.5	N/A	63.3	N/A	% Rec	~
undecane (Surr.)	107	N/A	108	N/A	106	N/A	% Rec	~
1,2-dichlorobenzene-d4 (Surr.)	77.7	N/A	71.7	N/A	99.5	N/A	% Rec	~

Sample Description	TP4 7' + TP4B 8' LEACHATE			
Sample Date	[Not Provided]			
Lab ID	1650079			
Volatile Organic Compounds	**Result**	**MDL**	**Units**	Criteria: O.Reg. 558
Benzene	<1	1	ug/L	500
1,1-Dichloroethylene	<3	3	ug/L	1400

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

Sample Description	TP4 7' + TP4B 8' LEACHATE
Sample Date	[Not Provided]
Lab ID	1650079

Volatile Organic Compounds	Result	MDL	Units	Criteria: O.Reg. 558
1,2-Dichlorobenzene	<3	3	ug/L	20000
1,2-Dichloroethane	<3	3	ug/L	500
1,2-Dichloroethane-d4 (Surr)	112	N/A	% Rec	~
1,4-Dichlorobenzene	<3	3	ug/L	500
1-Bromo-4-fluorobenzene (Surr.)	100	N/A	% Rec	~
Carbon tetrachloride	<2	2	ug/L	500
Chlorobenzene	<5	5	ug/L	8000
Chloroform	<3	3	ug/L	10000
Dichloromethane	<20	20	ug/L	5000
Methyl ethyl ketone	<50	50	ug/L	200000
Tetrachloroethylene	<3	3	ug/L	3000
Toluene-d8 (Surr.)	89.5	N/A	% Rec	~
Trichloroethylene	<2	2	ug/L	5000
Vinyl chloride	<1	1	ug/L	200

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 05/10/2021 16:36

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 428782

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

Matrix: If the matrix is a leachate, the sample was extracted according to Regulation 558.

[rr]: After a parameter name indicates a re-run of that parameter. If multiple re-runs exist they are suffixed by a number. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

% Rec: Surrogate compounds are added to the sample in some cases and the recovery is reported as a % recovered.

-: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

Reproduction of Report: Report shall not be reproduced, except in full, without the approval of Testmark Laboratories Ltd.

Verification Soil Sampling Program

526 Bay Street, Sault Ste. Marie, Ontario
Historic Contamination

December 10, 2021
TULLOCH Project #: 21-1339

71 Black Rd. Unit 8
Sault Ste. Marie,
ON
P6B 0A3

T. 705.949.1457
TF. 866.806.6602
F. 705.949.9606
saultstemarie@tulloch.ca
www.TULLOCH.ca

December 10, 2021
21-1339

Re: Verification Soil Sampling Program – Historic Contamination
526 Bay Street, Sault Ste. Marie, Ontario

Dear Mr. Tom Vair:

Please find enclosed the final version of TULLOCH's Report entitled "Verification Soil Sampling Program – Historic Contamination at 526 Bay Street, Sault Ste. Marie, Ontario".

Should you have questions, concerns or wish to discuss, please contact the undersigned at your convenience.

Sincerely,
TULLOCH Inc.

Tyler Moody, A.Sc.T.
Project Manager

tyler.moody@tulloch.ca

Encl.

Distribution List

# Of Hard Copies	PDF Required	Association / Company Name
	1	The Corporation of the City of Sault Ste. Marie

Revision Log

Revision #	Revised By	Date	Issue / Revision Description

EXECUTIVE SUMMARY

TULLOCH Inc. (TULLOCH) was retained by the Corporation of the City of Sault Ste. Marie (Client) to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum hydrocarbon (PHC) impacted soils at the property located at 526 Bay Street, Sault Ste. Marie, Ontario (Site).

The terms of reference for this project are based on TULLOCH being retained by the Client on June 2, 2021.

The objective of this VSSP was to to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum-impacted soils identified by the Client following the Phase II ESA assessment of the Site, and to verify that the soil at the final limits of the remedial excavation satisfy the applicable Ontario Ministry of the Environment, Conservation and Parks (MECP) Standards. The source and quantity of the impacts were suspected to be from a gasoline fueling station present at the Site in the 1940's-1960's.

The following is a summary of work completed during this VSSP:

- TULLOCH field personnel attended the Site between June 17 and September 3, 2021;
- One "worst-case" soil sample representative of the soil impacts was collected, and submitted for TCLP analysis;
- TULLOCH field personnel supervised and documented the removal of impacted soil through excavation, to complete a VSSP;
- Field observations made during the remedial excavation indicated the soil stratigraphy below surface consists of a heterogeneous layer of sand and gravel followed by reddish clay and silt, to the maximum depth of the excavation of 1.5 metres below ground surface (mbgs). Bedrock was encountered at 1.5 m or less and groundwater was not encountered during this investigation;
- Based on Site specific information, the soil quality was assessed based on the MECP Table 7 SCS for all soil types and industrial/commercial/community property uses;
- The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for disposal of impacted soils. The impacted soil was transported to the City of Sault Ste. Marie Landfill Disposal Site in Sault Ste. Marie, Ontario, by The

City of Sault Ste. Marie Public Works Department, an MECP-approved facility licensed to accept solid non-hazardous waste;

- Based on the size of the remedial excavation, a total of two "worst-case" floor samples and six "worst-case" wall samples were collected from the final limits of the excavation as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the potential contaminants of concern: BTEX and PHCs (F1-F4); Bedrock was discovered at 1.5 m or less, hence only two floor samples of the residual floor soils were collected during the excavation. During the investigation, groundwater was not encountered within the excavation which was advanced to a maximum depth of 1.5 mbgs.
- Some strong odours were noted in the final soil samples on the south and east walls, as well as the floor samples collected between the bedrock crevasses. The excavation was not permitted to extend beyond the edge of sidewalk on the south (sample S-6) and east (sample S-1) walls of the excavation and the best attempt was made at digging any loose bedrock and soils from the bottom of the excavation to the solid bedrock surface (sample S-21). Measurable BTEX and PHCs (F1-F4) soil concentrations from the remaining final limits of the excavation were below or undetectable compared to the applicable Table 7 Standards except on the south and east walls and the bottom of the exaction in the bedrock crevasses.

At the time of the excavation, City representatives indicated that they would be opting to finish the excavation at the current extents. Two additional wall samples were collected on the south (S-11) and east (S-3) walls to confirm the horizontal extents were clean further north and west of the impacted samples. The confirmed impacted soils samples (S-1 and S-6) are confined to a 6-meter length of wall on the southeast corner of the property at the intersection of the sidewalks on Bay and Bingham Streets, and the Site. Any further excavation would require that the sidewalks and potentially other infrastructure on public City of Sault Ste. Marie property be removed to continue the excavation.

The extents of the impacted soils have been removed from the Site up to the extent of the bedrock at 1.5 m or less, which is deemed to be practically accessible. Two soil samples (S-20 to S-24) were collected and submitted for analysis from the pockets and seams of the

bedrock floor. Though one floor soil sample contained elevated levels, the residual impact on the bedrock floor is both minimal (under one cubic meter) and practically inaccessible with the equipment available at the time of the excavation.

Based on the above, if the owner wishes to further investigate and/or excavate the impacted off-Site subsurface soils on the adjacent properties, City consent would be required prior to the compilation of any work plan.

TABLE OF CONTENTS

1. INTRODUCTION 5
2. BACKGROUND 5
3. EXCAVCATION METHODOLOGY 5
3.1 Scope of Work 5
3.2 Remedial Excavation Activities 6
3.3 Excavation Field Screening and Soil Sample Collection 7
3.4 Verification Soil Sampling 7
3.5 Analytical Testing 8
3.6 QA/QC Protocols 8
3.7 Site Condition Standards 9
4. RESULTS 9
4.1 Site Geology 9
4.2 Soil Vapour Concentrations and Field Observations 10
4.3 Analytical Results 10
4.4 QA/QC Results 11
4.5 Earthwork Volumes 12
4.6 Groundwater 12
4.7 Backfilling 12
5. CONCLUSIONS 13
6. DISCLAIMER 15
7. CLOSURE 17

LIST OF FIGURES

Figure 1 Excavation Key Plan
Figure 2 Sample Location Plan

LIST OF TABES

Table 1 Soil Verification Results

LIST OF APPENDICES

Appendix A Figures
Appendix B Photographs
Appendix C Summary Tables
Appendix D Laboratory Certificates of Analysis
Appendix E TCLP Letter & Disposal Slip

1. INTRODUCTION

TULLOCH Inc. (TULLOCH) was retained by the Corporation of the City of Sault Ste. Marie (Client) on June 2, 2021 to conduct and supervise a Remedial Excavation and Verification Soil Sampling Program (VSSP) of petroleum hydrocarbon (PHC) impacted soils at the property located at 526 Bay Street, Sault Ste. Marie, Ontario (Site).

As indicated on Figure 1 (Site Location Map), the Site is located on the northwest corner of the intersection of Bay and Bingham Streets, in Sault Ste. Marie, Ontario. The area of remediation was adjacent to the sidewalks on the southeast corner of the Site; as shown on Figure 2 (Sample Location Plan). All figures are provided in Appendix A.

2. BACKGROUND

TULLOCH previously performed a Phase I and II ESA for the Site in 2020 and determined that the southeast corner of the Site had historic petroleum impacts in the soils from a former fueling station on the Site. TULLOCH was retained on June 2, 2021, to remediate the historic petroleum soil impacts.

3. EXCAVCATION METHODOLOGY

3.1 Scope of Work

The scope of work completed by TULLOCH, as part of the remediation and VSSP, included the following:

- Provide on-Site documentation of petroleum hydrocarbon (PHC) impacted soil removal activities to record field observations during the excavation process, which included visual and olfactory evidence of soil impacts following a field screening program using a Catalytic Combustion Monitor (CCM);
- Upon removal of the PHC-impacted soil from the subsurface, and once the excavation limits have been established, remedial verification soil samples were collected from the walls and floors of the excavation to identify any residual soil contaminant levels. The sampling plan was prepared and performed in accordance with the Ministry of Environment, Conservation and Parks (MECP) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" dated December 1996, (MECP Sampling Document);

- All remedial verification soil samples collected as part of this program were submitted to an independent and accredited laboratory for analysis of the following potential contaminants of concern: benzene, toluene, ethylbenzene, xylenes (BTEX) and PHCs fractions F1 through F4 (F1-F4);
- TULLOCH completed an assessment of the Site to determine the appropriate site condition standards as identified in the MOE document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" dated April 15, 2011 (2011 MOE Standards);
- TULLOCH collected and submitted one field duplicate soil sample for quality assurance and quality control (QA/QC) purposes; which were analyzed for the potential contaminants of concern;
- Upon receipt of the soil and groundwater analytical data, TULLOCH compared the results with the applicable criteria stipulated in the 2011 MECP Standards; and
- TULLOCH prepared a report documenting the findings of the assessment and recommendations related to subsurface impacts.

3.2 Remedial Excavation Activities

TULLOCH field personnel attended the Site on September 3, 2021, to conduct, supervise and document the removal of impacted soil from the excavation and to complete a VSSP. The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for the disposal of impacted soil at the City of Sault Ste. Marie Landfill. Pending receipt of the TCLP soil analytical results, the impacted soils were transported to The City of Sault Ste Maire Landfill in Sault Ste. Marie, Ontario, an MECP-approved facility licensed to accept solid non-hazardous waste.

Subsurface conditions were logged by TULLOCH personnel during the remedial excavation. Soil samples were strategically collected from the sidewalls and floor of the final excavation for field screening purposes, visual and olfactory classification, as well as for submission for laboratory analysis and verification. Site photographs of the remedial activities completed are located in Appendix B.

3.3 Excavation Field Screening and Soil Sample Collection

Field sampling was completed in accordance with the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996 (MECP Sampling Guidelines).

The encountered stratigraphy (e.g., major soil types, colour and moisture), as well as visual and olfactory evidence of potential environmental contamination was noted. Soil samples were split and deposited into laboratory supplied jars and placed on ice to preserve sample integrity for laboratory submission; the second half of the sample was placed into plastic Ziploc® bags and left in a warm area and left to volatilize under warm temperatures for a minimum of 10 minutes. Measurement of headspace vapour concentrations were taken from each soil sample recovered using portable hydrocarbon detection instrument (RKI Eagle) to measure total combustible organic vapours (COVs).

Clean nitrile gloves were used between samples throughout the investigation program to prevent cross-contamination of the recovered samples. Samples to be shipped for chemical analysis were packaged in coolers with sufficient packing material to ensure safe shipment of glass containers. Samples were kept cool (<10°C) with ice or ice packs.

TULLOCH placed soil samples for laboratory analysis directly into new, labeled, laboratory-supplied containers. TULLOCH packed the soil into the containers minimizing the volume of headspace in each sample reducing the potential for volatile losses. Labeled samples were placed in coolers with ice for temporary storage and transport to the analytical laboratory. TULLOCH transported the soil samples using standard chain-of-custody procedures. The final limits of the remedial excavation illustrating the field screening sample locations, COV concentrations and locations of verification soil samples submitted for analysis are depicted on Figure 2, located in Appendix A.

3.4 Verification Soil Sampling

Following the excavation and temporary stockpiling of the impacted soils, a total of eight "worst-case and/or spatially dispersed" floor samples and ten "worst-case and/or spatially dispersed" sidewall samples including a field duplicate were collected from the final excavation limits as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the parameters BTEX and PHCs (F1-F4).

Samples collected for analysis, along with their respective locations and parameters are provided in Table 1, located in Appendix C.

3.5 Analytical Testing

Since the results of chemical analyses are to be compared to the MECP SCS, it is essential that well documented, validated and consistently applied analytical methods are utilized and that appropriate quality assurance and quality control (QA/QC) procedures be carried out. The samples collected from the Site were submitted to SGS Laboratories in Lakefield, Ontario, which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the "International Standards ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories", dated December 15, 1999. All analyses used the analytical methods prescribed in the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", as amended.

3.6 QA/QC Protocols

QA/QC protocols were followed during excavation activities and verification sampling to ensure that representative samples were obtained. Field protocols that were employed included:

- Soil samples were extracted from the interior of the sampling device (where possible) or face of excavation, rather than from areas in contact with the sampler walls to minimize the potential for cross-contamination;
- Soil samples collected were placed in laboratory-supplied glass sample jars;
- Refrigeration / icing of all samples immediately upon collection and maintained en route to the laboratory;
- Dedicated and disposable Nitrile™ gloves were used for all sample handling;
- All non-dedicated sampling equipment was cleaned prior to initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture;
- One field duplicate sample was collected and analyzed were submitted for all parameters of concern and an evaluation of the relative percent difference calculations was completed; and
- Sample collection and handling procedures were performed in accordance with industry standards and the MECP Sampling Document.

SGS's internal laboratory QA/QC consisted of the analysis of a laboratory duplicate, method blank and matrix spike, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries for the method blank and matrix spike samples.

3.7 Site Condition Standards

The Site is a commercial property located within Sault Ste. Marie. It is TULLOCH's understanding that potable water for the Site and surrounding area is supplied by a municipal water system.

The results of the soil and water analyses were compared to the generic criteria described in the MECP's "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011" under O. Reg. 153/04 (O. Reg. 153/04), as amended by O.Reg.511/09 (MECP SCS).

Ontario Regulation 153/04 (as amended) states that a Site is classified as an "environmentally sensitive area" if the pH of the surface soil (less than 1.5 mbgs) is less than 5 or greater than 9, the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the Site is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. TULLOCH 2020 Phase II ESA previously identified that soils at the Site are within the specified range. The Site is not an area of natural significance, and it is not adjacent to, nor does it contain, land within 30 metres of an area of natural significance. As such, the Site is not considered to be an environmentally sensitive area.

The Site is not within 30 metres of a waterbody.

Based on the above, the appropriate MECP SCS for the Site is Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for all soils for Industrial/Commercial/Community land uses.

As such, all analytical results have been compared to these *Table 7 SCS MECP Standards.*

4. RESULTS

4.1 Site Geology

Based on the soil samples recovered from the remedial excavation, the soil stratigraphy below surface consists of a layer of gravel and some sand changing to reddish clay and silt, to the

maximum depth of the excavation of 1.5 mbgs. Bedrock was encountered at 5 feet or less and groundwater was not encountered during the excavation. Based on the elevation of the Site and the St. Marys River to the south, the groundwater level is anticipated to be within the bedrock below the on-Site excavations.

4.2 Soil Vapour Concentrations and Field Observations

Vapour concentrations measured in the verification soil samples collected during the remedial excavation investigation are presented on Figure 2 in Appendix A. Vapour concentrations were measured between 0 and 4000 ppm among the extents of the final remedial excavation.

Some strong odours were noted in the final soil samples on the south and east walls, as well as the floor samples collected between the bedrock crevasses. The excavation was not permitted to extend beyond the edge of sidewalk on the south (sample S-6) and east (sample S-1) walls of the excavation as directed by the City of Sault Ste. Marie and the best attempt was made at digging any loose bedrock and soils from the bottom of the excavation to the solid bedrock surface (S-21). No odours or staining were observed in the remaining soil samples collected from the north and west walls final limits of the remedial excavation.

4.3 Analytical Results

Soil Results

Three samples with strong odours from the limits of the excavation on the floor and the south and east walls failed the Table 7 SCS. The failures were collected from under the sidewalks on Bingham and Bay Street and from the bedrock crevices on the floor of the excavation, all these locations could not be further excavated for various reasons stated above. As indicated in Table 2 in Appendix C, all other reported concentrations of BTEX and PHCs (F1-F4) in the soil samples from the final extents of the remedial excavation met the Table 7 SCS.

Waste Characterization Results

A copy of the TCLP analytical results and soils disposal letter along with the leachate quality criteria listed in Schedule 4 of Ontario Regulation 347 (as amended) (Schedule 4 Criteria) can be found in Appendix E.

As indicated in the TCLP soils disposal letter and analytical results, the leachate concentrations in the soil sample were below the applicable Schedule 4 Criteria and the sample was not ignitable. Based on these findings, the PHC-impacted soil from the excavation was determined to be suitable for off-Site disposal as non-hazardous solid waste.

The laboratory Certificates of Analysis for the soil and groundwater samples are provided in Appendix D.

4.4 QA/QC Results

No laboratory instrumentation, shipping, chain of custody, breakage or temperature control issues were noted in the Certificate of Analysis provided by SGS that would suggest an invalidation of the analytical data.

All field instrumentation calibration checks were completed by TULLOCH field staff members prior to use on-Site. All field operations conducted by TULLOCH field staff members were completed using standard equipment decontamination and sampling procedures, and no deviations from the sampling plan were noted.

No field or laboratory QA/QC issues were identified with the respective sampling and lab analysis that would be expected to impact the quality of data and/or the conclusions presented in this report. Various quality assurance/quality control (QA/QC) protocols were followed during the assessment to ensure that representative samples were obtained, and that representative analytical data were reported by the laboratory.

Field sampling was completed in accordance with the MECP document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996 (MECP Sampling Guidelines).

Soil samples were submitted to SGS Laboratories, an independent Canadian Association for Analytical Laboratories (CALA) accredited laboratory facility. Chain of Custody forms were completed in the field for tracking purposes.

SGS's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries for the method blank, matrix spike and spiked blank samples.

4.5 Earthwork Volumes

The final measured arial extent of the excavation was approximately 47 m^2, with a maximum depth of approximately 1.5 mbgs. A total of approximately 50 metric tons of impacted soil were disposed of at the City of Sault Ste. Marie Landfill in Sault Ste. Marie, Ontario.

4.6 Groundwater

Groundwater was not encountered during or within the remedial soil excavation. Based on the water level of nearby St. Mary's River, it is anticipated that the groundwater level will be not far below the bedrock level of the bottom of the remedial excavation.

4.7 Backfilling

The City of Sault Ste. Marie Public Works Department performed backfilling and soil compaction activities subsequent to excavation operations. The excavation area was reportedly backfilled to grade with imported granular fill material from The City of Sault Ste. Marie's chosen gravel pit. TULLOCH was not retained to provide backfilling, compaction, or restoration supervision, therefore, a sample of the fill material was not sent for laboratory analysis.

5. CONCLUSIONS

The following is a summary of work completed during this VSSP:

- TULLOCH field personnel attended the Site between June 17 and September 3, 2021;
- One "worst-case" soil sample representative of the soil impacts was collected on June 17, 2021, and submitted for TCLP analysis;
- TULLOCH field personnel supervised and documented the removal of impacted soil through excavation on September 3, 2021, to complete a VSSP;
- Field observations made during the remedial excavation indicated the soil stratigraphy below surface consists of a heterogeneous layer of sand and gravel followed by redish clay and silt, to the maximum depth of the excavation of 1.5 mbgs. Bedrock was encountered at 1.5 m or less and groundwater was not encountered during this investigation;
- Based on Site specific information, the soil quality was assessed based on the MECP Table 7 SCS for all soil types and industrial/commercial/community property uses;
- The City of Sault Ste. Marie provided one track-mounted excavator and MECP-licensed tandem dump trucks for disposal of impacted soils. Approximately 50 metric tonnes of impacted soil were transported to the City of Sault Ste. Marie Landfill Disposal Site in Sault Ste. Marie, Ontario, by The City of Sault Ste. Marie Public Works Department, an MECP-approved facility licensed to accept solid non-hazardous waste;
- Based on the size of the remedial excavation, a total of two "worst-case" floor samples and six "worst-case" wall samples were collected from the final limits of the excavation as verification soil samples in accordance with the applicable regulatory criteria and submitted for laboratory analysis of the potential contaminants of concern: BTEX and PHCs (F1-F4); Bedrock was discovered at 1.5 m or less, hence only two floor samples of the residual floor soils were collected during the excavation. During the investigation, groundwater was not encountered within the excavation which was advanced to a maximum depth of 1.5 mbgs.
- Some strong odours were noted in the final soil samples on the south and east walls, as well as the floor samples collected between the bedrock crevasses. The excavation was not permitted to extend beyond the edge of sidewalk on the south (sample S-6) and east (sample S-1) walls of the excavation and the best attempt was made at digging any

loose bedrock and soils from the bottom of the excavation to the solid bedrock surface (sample S-21). Measurable BTEX and PHCs (F1-F4) soil concentrations from the remaining final limits of the excavation were below or undetectable compared to the applicable Table 7 Standards.

At the time of the excavation, City representatives indicated that they would be opting to finish the excavation at the current extents. Two additional wall samples were collected on the south (sample S-11) and east (sample S-3) walls to confirm the horizontal extents were clean further north and west of the impacted samples. The confirmed impacted soils samples (S-1 and S-6) are confined to a 6 meter length of walls on the southeast corner of the property at the intersection of the sidewalks on Bay and Bingham Streets and the Site. Any further excavation would require that the sidewalks and potentially other infrastructure on public City of Sault Ste. Marie property be removed to continue the excavation.

The extents of the impacted soils have been removed from the Site up to the extent of the bedrock at 1.5 m or less, which is deemed to be practically accessible. Two soil samples (S-20 to S-24) were collected and submitted for analysis from the pockets and seams of the bedrock floor.
Though one floor soil sample contained elevated levels, the residual soil impact on the bedrock floor is both minimal (under one cubic meter) and practically inaccessible with the equipment available at the time of the excavation.

Based on the above, if the owner wishes to further investigate and/or excavate the impacted off-Site subsurface soils on the adjacent properties, City consent would be required prior to the compilation of any work plan.

6. DISCLAIMER

The attached Verification Soil Sampling Program (Report) has been prepared by TULLOCH Inc. (Consultant) for the benefit of the Client in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (Agreement).

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (Limitations);
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;

has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;

- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by Consultant and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (improper use of the Report), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

7. CLOSURE

We trust you will find the information presented acceptable and meets your requirements. If you have any questions, do not hesitate to contact the undersigned at your convenience.

Sincerely,
TULLOCH Inc.

Rod Morrison
Engineering Technologist

Tyler Moody, A.Sc.T.
Project Manager

Cc: Robert Bressan, P.Eng., FEC
Environmental Engineer

APPENDIX A

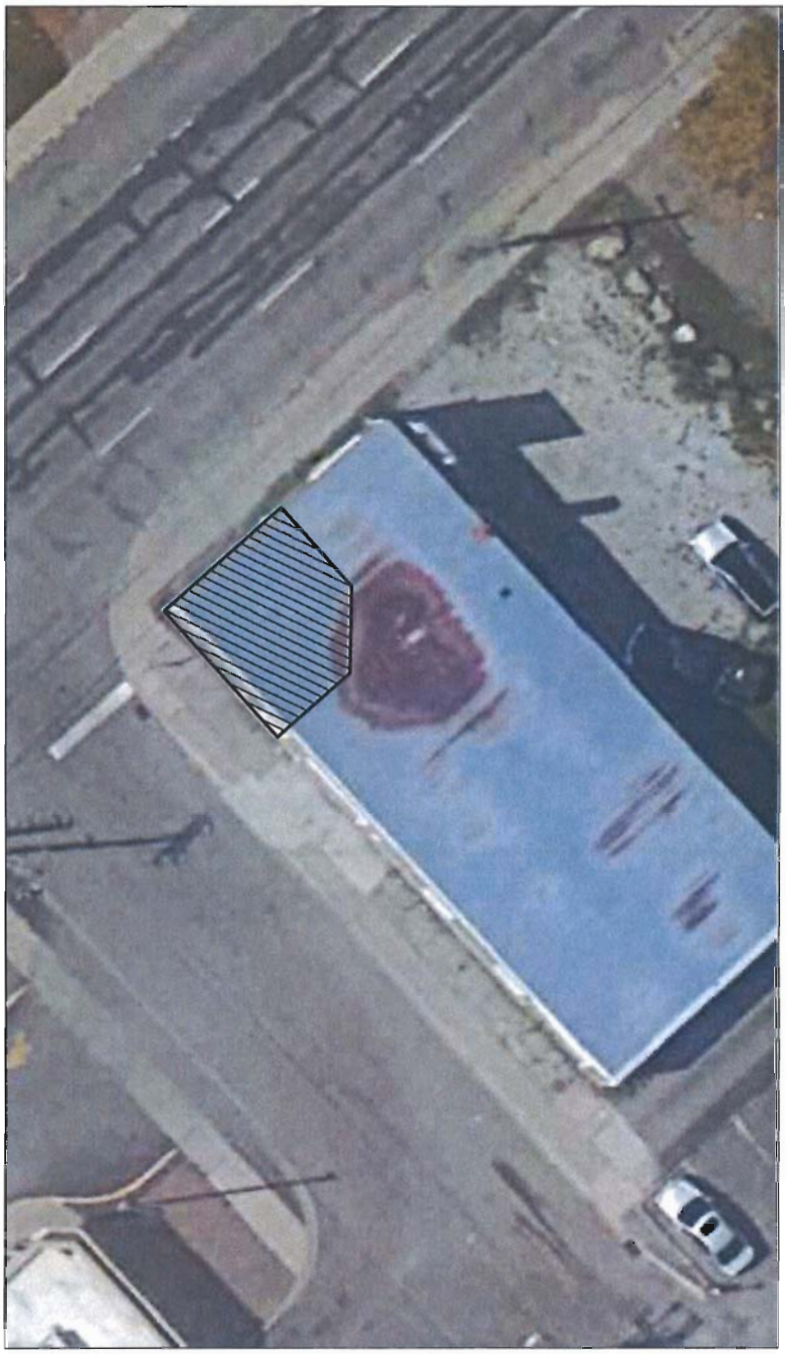
FIGURES

K:\2021\Engineering\211339 BrooksMcIlroy - 526 Bay St\DWG\21-1339 - Bay Street - 101421.dwg

LEGEND

EXCAVATION AREA

EXCAVATION KEY PLAN



SCALE IN METERS

PROJECT:

VERIFICATION SOIL SAMPLING PROGRAM

526 BAY STREET

SAULT STE. MARIE, ONTARIO

TULLOCH ENGINEERING

DRAWING:

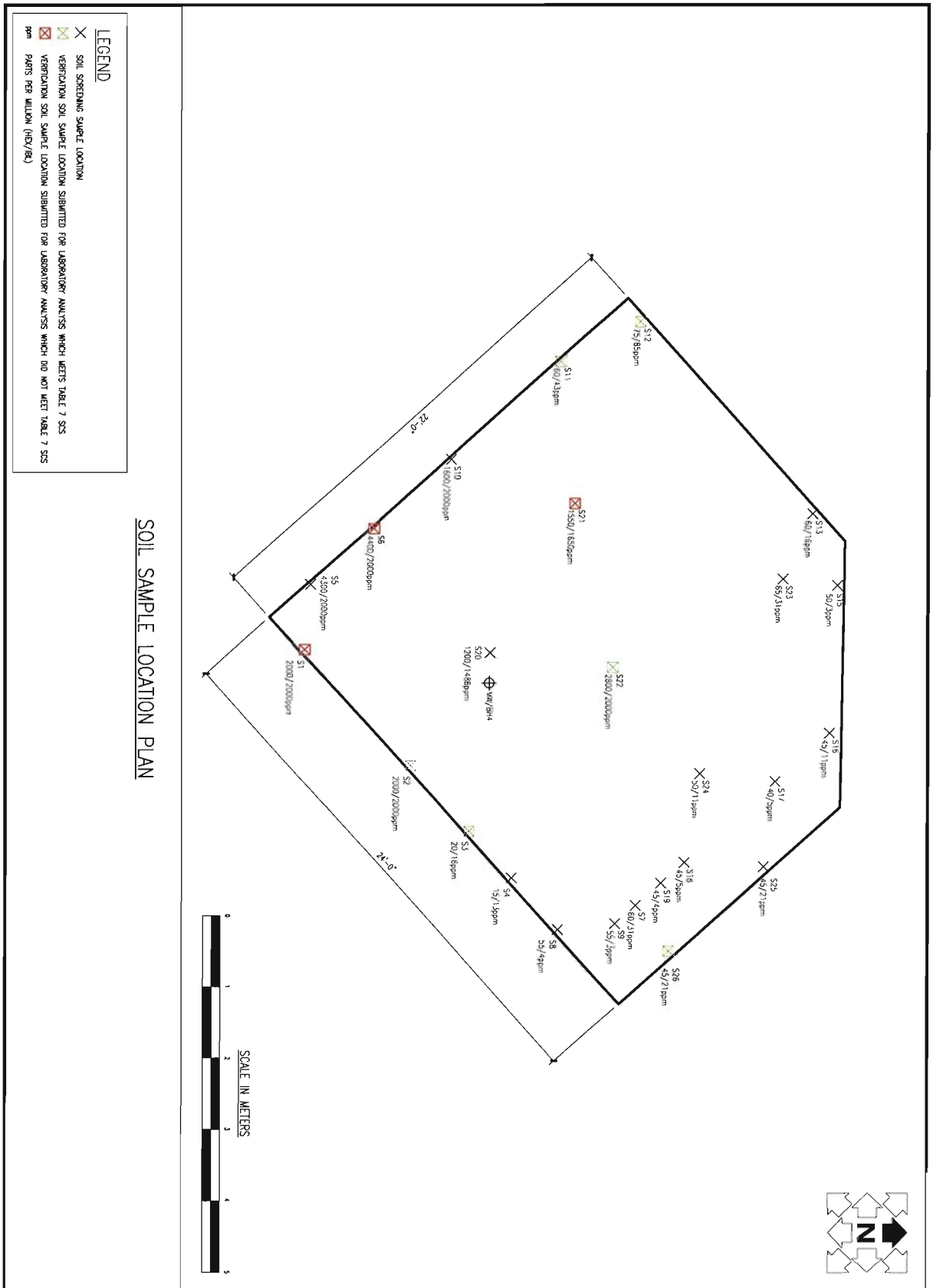
EXCAVATION KEY PLAN

ENGINEER'S SEAL

No	DATE	BY	ISSUES / REVISIONS
0	OCT. 15, 2021	C.M.	ISSUED FOR REPORT

DRAWN BY:	CHECKED BY:	PROJECT No.
C.M.	T.M.	21-1339
DESIGNED BY:	APPROVED BY:	DRAWING No. / REVISION No.
R.M.	T.M.	F1 / 0
SCALE:	DATE:	
N.T.S.	OCT. 14, 2021	

K:\2021\Engineering\211339 BrookMcIlroy - 526 Bay St\DWG\21-1339 - Bay Street - 101421.dwg



PROJECT:
VERIFICATION SOIL SAMPLING PROGRAM
526 BAY STREET
SAULT STE. MARIE, ONTARIO

TULLOCH ENGINEERING

DRAWING:
SOIL SAMPLE LOCATION PLAN

ENGINEER'S SEAL

No.	DATE	BY	ISSUES / REVISIONS
0	OCT. 15, 2021	C.M.	ISSUED FOR REPORT

DRAWN BY: C.M.	CHECKED BY: T.M.	PROJECT No 21-1339	
DESIGNED BY: R.M.	APPROVED BY: T.M.	DRAWING No. F2	REVISION No. 0
SCALE: N.T.S.	DATE: OCT. 14, 2021		

APPENDIX B

SITE PHOTOGRAPHS

Photo 1 – View of the remedial excavation, looking east.

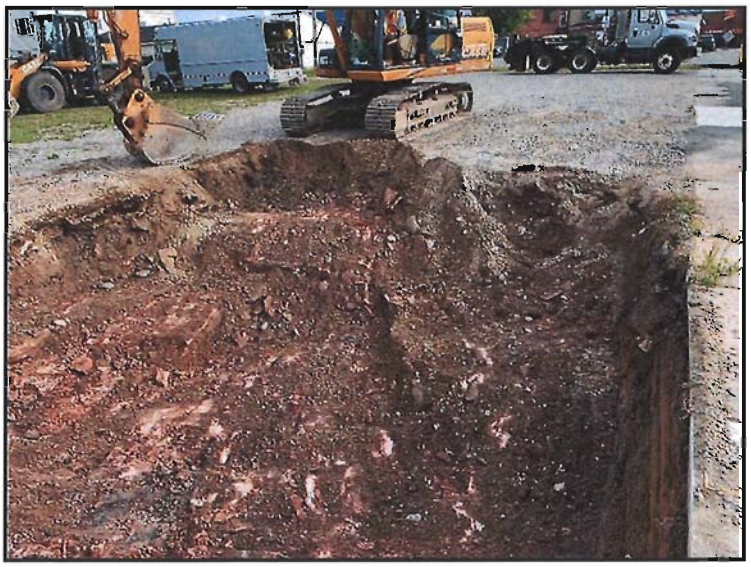


Photo 2 – View of the remedial excavation, looking north.

Photo 3 – View of the active remedial excavation removing soils from western portion of the excavation, looking west.

Photo 4 – View of the active remedial excavation while continuing to dig westwards, looking south.

APPENDIX C

SUMMARY TABLES

TULLOCH

TABLE 1 - SOIL ANALYTICAL RESULTS
Soil Remediation VSSP
526 Bay Street, Sault Ste. Marie, Ontario

SAMPLE ID		S-1	S-3	S-6	S-11	S-12	S-20	STANDARDS, CRITERIA & OBJECTIVES
Date Sampled (mm/dd/yyyy)		3/9/2021	3/9/2021	3/9/2021	3/9/2021	3/9/2021	3/9/2021	
Laboratory Sample #		7	8	9	10	11	12	
Sample Location		Wall	Wall	Wall	Wall	Wall	Floor	
Sample Depth (mbg[1])		1.7	1.0	0.9	0.9	0.9	1.8	
Combustible Organic Vapor Reading[2]		2000 ppm	20 ppm	4400 ppm	60 ppm	75 ppm	1200 ppm	
Sample Visual Observation		Grey/black clay and silt. Strong odours.	Redish clay and silt. No odours.	Grey/black dlay and silt. Strong odours.	Redish brown sand and gravel. No odours.	Redish brown sand and gravel. No odours.	Redish brown sand and silt. Strong odours.	MECP Table 7 SCS[3]
PARAMETER	**Units**							
Volatile Organic Compounds								
Benzene	µg/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.32
Toluene	µg/g	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	68
Ethylbenzene	µg/g	<0.05	<0.05	**6.82**	<0.05	0.25	<0.05	9.5
Xylene Mixture	µg/g	0.11	0.07	**46.8**	<0.05	1.6	<0.05	26
PHC Fractions F1 to F4								
F1 (C6-C10) - Less BTEX[5]	µg/g	79	<10	**1440**	<10	30	12	55
F2 (C10-C16)	µg/g	51	<10	**780**	<10	<10	<10	230
F3 (C16-C34)	µg/g	<50	<50	<50	<50	<50	<50	1700
F4 (C34-C50)	µg/g	<50	<50	<50	<50	<50	<50	3300

[1]All sample depths are recorded as "metres below grade".

[2]Headspace measured with RKI Eagle Catalytical Combustion Monitor. Results reported in "parts per million" or "% lower explosive limit".

[3]MECP Standard- "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15th, 2011, Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition, industrial/Commercial/Community Land Use.

[4]Total Xylene values are given as the sum of the m+p-Xylene and o-Xylene values.

[8]F1 values represent the results for the C6 - C10 hydrocarbon fraction, with the BTEX results subtracted.

INSF means insufficient sample available to conduct a COV measurement.

Shaded Cells- Result exceeds MECP Table 7 SCS.

Checked By: Tyler Moody / Rob Bressan

TULLOCH Project 21-1339

TULLOCH

TABLE 1 - SOIL ANALYTICAL RESULTS
Soil Remediation VSSP
526 Bay Street, Sault Ste. Marie, Ontario

SAMPLE ID		S-21	S-25	DUP-1				STANDARDS, CRITERIA & OBJECTIVES
Date Sampled (mm/dd/yyyy)		3/9/2021	3/9/2021	3/9/2021				
Laboratory Sample #		13	14	15				
Sample Location		Floor	Wall	S-3				
Sample Depth (mbg[1])		1.5	0.9	1.0				
Combustible Organic Vapor Reading[2]		1550 ppm	45 ppm	20 ppm				
Sample Visual Observation		Redish brown sand and silt. Strong odours.	Brown sand and gravel. No odours.	Redish clay and silt. No odours.				
PARAMETER	**Units**							MECP Table 7 SCS[3]
Volatile Organic Compounds								
Benzene	µg/g	<0.02	<0.02	<0.02				0.32
Toluene	µg/g	<0.05	<0.05	<0.05				68
Ethylbenzene	µg/g	0.46	<0.05	<0.05				9.5
Xylene Mixture	µg/g	**3.65**	<0.05	<0.05				26
PHC Fractions F1 to F4								
F1 (C6-C10) - Less BTEX[5]	µg/g	**273**	<10	<10				55
F2 (C10-C16)	µg/g	**118**	<10	<10				230
F3 (C16-C34)	µg/g	<50	60	<50				1700
F4 (C34-C50)	µg/g	<50	<50	<50				3300

[1]All sample depths are recorded as "metres below grade".

[2]Headspace measured with RKI Eagle Catalytical Combustion Monitor. Results reported in "parts per million" or "% lower explosive limit".

[3]MECP Standard- "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15th, 2011, Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition, industrial/Commercial/Community Land Use.

[4]Total Xylene values are given as the sum of the m+p-Xylene and o-Xylene values.

[8]F1 values represent the results for the C6 - C10 hydrocarbon fraction, with the BTEX results subtracted.

INSF means insufficient sample available to conduct a COV measurement.

Shaded Cells - Result exceeds MECP Table 7 SCS.

Checked By: Tyler Moody / Rob Bressan

TULLOCH Project 21-1339

APPENDIX D

LABORATORY CERTIFICATES OF ANALYSIS

FINAL REPORT

CA15145-SEP21 R

21-1339

Prepared for

Tulloch Engineering

FINAL REPORT

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Tulloch Engineering	Project Specialist	Maarit Wolfe, Hon.B.Sc
		Laboratory	SGS Canada Inc.
Address	71 Black Road, Unit 8 Sault Ste. Marie, Ontario P6B 0A3. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Rod Morrison	Telephone	705-652-2000
Telephone	705-949-1457	Facsimile	705-652-6365
Facsimile		Email	Maarit.Wolfe@sgs.com
Email	rod.morrison@tulloch.ca;ssmenv@tulloch.ca	SGS Reference	CA15145-SEP21
Project	21-1339	Received	09/08/2021
Order Number		Approved	09/15/2021
Samples	Soil (9)	Report Number	CA15145-SEP21 R
		Date Reported	09/15/2021

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

Temperature of Sample upon Receipt: 10 degrees C

Cooling Agent Present:Yes

Custody Seal Present:Yes

Chain of Custody Number:026221

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

TABLE OF CONTENTS

First Page..... 1
Index..... 2
Results..... 3-5
Exceedance Summary..... 6
QC Summary..... 7-9
Legend..... 10
Annexes..... 11

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Rod Morrison
Samplers: Rod Morrison

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

					Sample Number	7	8	9	10	11	12	13	14
					Sample Name	21-1339 S-1	21-1339 S-3	21-1339 S-6	21-1339 S-11	21-1339 S-12	21-1339 S-20	21-1339 S-21	21-1339 S-25
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Sample Date	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
BTEX													
Benzene	µg/g	0.02	0.32	0.21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	µg/g	0.05	9.5	2	< 0.05	< 0.05	6.82	< 0.05	0.25	< 0.05	0.46	< 0.05
Toluene	µg/g	0.05	68	2.3	< 0.05	< 0.05	0.10	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Xylene (total)	µg/g	0.05	26	3.1	0.11	0.07	46.8	< 0.05	1.60	< 0.05	3.65	< 0.05
m/p-xylene	µg/g	0.05			0.11	0.07	44.9	< 0.05	1.50	< 0.05	3.28	< 0.05
o-xylene	µg/g	0.05			< 0.05	< 0.05	1.96	< 0.05	0.09	< 0.05	0.36	< 0.05

PACKAGE: **REG153 - BTEX** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

					Sample Number	15
					Sample Name	21-1339 DUP-1
					Sample Matrix	Soil
					Sample Date	03/09/2021
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	
BTEX						
Benzene	µg/g	0.02	0.32	0.21	< 0.02	
Ethylbenzene	µg/g	0.05	9.5	2	< 0.05	
Toluene	µg/g	0.05	68	2.3	< 0.05	
Xylene (total)	µg/g	0.05	26	3.1	< 0.05	
m/p-xylene	µg/g	0.05			< 0.05	
o-xylene	µg/g	0.05			< 0.05	

PACKAGE: REG153 - Metals and Inorganics (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

Parameter	Units	RL	L1	L2	Sample Number	7	8	9	10	11	12	13	14
					Sample Name	21-1339 S-1	21-1339 S-3	21-1339 S-6	21-1339 S-11	21-1339 S-12	21-1339 S-20	21-1339 S-21	21-1339 S-25
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Sample Date	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021
						Result	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics													
Moisture Content	%	-				12.4	15.2	11.4	11.1	11.7	9.6	9.8	9.0

PACKAGE: REG153 - Metals and Inorganics (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

Parameter	Units	RL	L1	L2	Sample Number	15
					Sample Name	21-1339 DUP-1
					Sample Matrix	Soil
					Sample Date	03/09/2021
						Result
Metals and Inorganics						
Moisture Content	%	-				12.9

PACKAGE: REG153 - PHCs (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

Parameter	Units	RL	L1	L2	Sample Number	7	8	9	10	11	12	13	14
					Sample Name	21-1339 S-1	21-1339 S-3	21-1339 S-6	21-1339 S-11	21-1339 S-12	21-1339 S-20	21-1339 S-21	21-1339 S-25
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Sample Date	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021
						Result	Result	Result	Result	Result	Result	Result	Result
PHCs													
F1 (C6-C10)	µg/g	10	55	55		79	< 10	1440	< 10	30	12	277	< 10
F1-BTEX (C6-C10)	µg/g	10	55	55		79	< 10	1390	< 10	28	12	273	< 10
F2 (C10-C16)	µg/g	10	230	98		51	< 10	780	< 10	< 10	< 10	118	< 10
F3 (C16-C34)	µg/g	50	1700	300		< 50	< 50	< 50	< 50	< 50	< 50	< 50	60
F4 (C34-C50)	µg/g	50	3300	2800		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Rod Morrison
Samplers: Rod Morrison

PACKAGE: **REG153** - PHCs (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

				Sample Number	7	8	9	10	11	12	13	14
				Sample Name	21-1339 S-1	21-1339 S-3	21-1339 S-6	21-1339 S-11	21-1339 S-12	21-1339 S-20	21-1339 S-21	21-1339 S-25
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021	03/09/2021
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
PHCs (continued)												
Chromatogram returned to baseline at nC50	Yes / No	-			YES	YES	YES	YES	YES	YES	YES	YES

PACKAGE: **REG153** - PHCs (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED
L2 = REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED

				Sample Number	15	
				Sample Name	21-1339 DUP-1	
				Sample Matrix	Soil	
				Sample Date	03/09/2021	
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	
PHCs						
F1 (C6-C10)	µg/g	10	55	55	< 10	
F1-BTEX (C6-C10)	µg/g	10	55	55	< 10	
F2 (C10-C16)	µg/g	10	230	98	< 10	
F3 (C16-C34)	µg/g	50	1700	300	< 50	
F4 (C34-C50)	µg/g	50	3300	2800	< 50	
Chromatogram returned to baseline at nC50	Yes / No	-			YES	

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	REG153 / SOIL / COARSE - TABLE 7 - Industrial/Commercial - UNDEFINED L1	REG153 / SOIL / COARSE - TABLE 7 - Residential/Parkland - UNDEFINED L2
21-1339 S-1					
F1 (C6 to C10)	CCME Tier 1	µg/g	79	55	55
F1 (C6 to C10) minus BTEX	CCME Tier 1	µg/g	79	55	55
21-1339 S-6					
F1 (C6 to C10)	CCME Tier 1	µg/g	1440	55	55
F1 (C6 to C10) minus BTEX	CCME Tier 1	µg/g	1390	55	55
F2 (C10 to C16)	CCME Tier 1	µg/g	780	230	98
Ethylbenzene	EPA 5035A/5030B/8260C	µg/g	6.82		2
Xylene Mixture	EPA 5035A/5030B/8260C	µg/g	46.8	26	3.1
21-1339 S-21					
F1 (C6 to C10)	CCME Tier 1	µg/g	277	55	55
F1 (C6 to C10) minus BTEX	CCME Tier 1	µg/g	273	55	55
F2 (C10 to C16)	CCME Tier 1	µg/g	118		98
Xylene Mixture	EPA 5035A/5030B/8260C	µg/g	3.65		3.1

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F1 (C6-C10)	GCM0200-SEP21	µg/g	10	<10	ND	30	102	80	120	79	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
F2 (C10-C16)	GCM0133-SEP21	µg/g	10	<10	ND	30	90	80	120	89	60	140
F3 (C16-C34)	GCM0133-SEP21	µg/g	50	<50	ND	30	90	80	120	89	60	140
F4 (C34-C50)	GCM0133-SEP21	µg/g	50	<50	ND	30	90	80	120	89	60	140

QC SUMMARY

Volatile Organics

Method: EPA 5035A/5030B/8260C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Benzene	GCM0200-SEP21	µg/g	0.02	<0.02	ND	50	78	60	130	59	50	140
Ethylbenzene	GCM0200-SEP21	µg/g	0.05	<0.05	ND	50	72	60	130	60	50	140
m/p-xylene	GCM0200-SEP21	µg/g	0.05	<0.05	ND	50	73	60	130	60	50	140
o-xylene	GCM0200-SEP21	µg/g	0.05	<0.05	ND	50	74	60	130	63	50	140
Toluene	GCM0200-SEP21	µg/g	0.05	<0.05	ND	50	75	60	130	60	50	140

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

QC SUMMARY

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

SGS Request for Laboratory Services and CHAIN OF CUSTODY

Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 026221 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Cheaxdumm | Received By (signature): Chris Irwin
Received Date: 08/09/21 (mm/dd/yy) | Custody Seal Present: Yes ☑ No ☐ | Cooling Agent Present: Yes ☑ No ☐ Type: Ice
Received Time: ____:____ (hr:min) | Custody Seal Intact: Yes ☑ No ☐ | Temperature Upon Receipt (°C) 10.11.10 | LAB LIMS #: CA-15145-Sep21

REPORT INFORMATION	INVOICE INFORMATION
Company: Tulloch	☐ (same as Report Information)
Contact: Rod Morrison	Company:
Address: 71 Black Rd. Sault Ste. Marie ON	Contact:
Phone: 705-949-1457	Address:
Fax:	Phone:
Email: ssmenv@tulloch.ca	Email: ap@tulloch.ca.

Quotation #: | P.O. #:
Project #: 21-1339 | Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days) — TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date: | *NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☑ O.Reg 153/04 ☐ O.Reg 406/19

☐ Table 1 ☐ Res/Park Soil Texture: ☑ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☑ Table 7 Appx.
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA ☐ ODWS Not Reportable *See note

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

RECORD OF SITE CONDITION (RSC) ☐ YES ☑ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	21-1339 S-1	Sept 3 2021		3	S
2	" S-3				
3	" S-6				
4	" S-11				
5	" S-12				
6	" S-20				
7	" S-21				
8	" S-25				
9	" Dup-1				
10					
11					
12					

M & I				SVOC		PCB	PHC		VOC		Pest	Other (please specify)						SPLP	TCLP	COMMENTS:
Field Filtered (Y/N)	Metals & Inorganics Incl CrVI, CN,Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	PAHs only	SVOCs all incl PAHs, ABNs, CPs	PCBs Total ☐ Aroclor ☐	F1-F4 + BTEX	F1-F4 only no BTEX	VOCs all incl BTEX	BTEX only	Pesticides Organochlorine or specify other					Sewer Use: Specify pkg:	Water Characterization Pkg General ☐ Extended ☐	Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	
							X													
							X													
							X													
							X													
							X													
							X													
							X													
							X													
							X													

Observations/Comments/Special Instructions

Sampled By (NAME): Rod Morrison	Signature:	Date: Sept 3 2021 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Rod Morrison	Signature:	Date: Sept 7 2021 (mm/dd/yy)	Yellow & White Copy - SGS

Revision # 1.5
Date of Issue: 11 June 2021

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. (2) Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). (3) Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

APPENDIX E

TCLP LETTER

TULLOCH
ENGINEERING

71 Black Road
Unit 8
Sault Ste. Marie,
ON
P6B 0A3

T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602

saultstemarie@TULLOCH.ca

July 20, 2021
21-1339

Mr. Mike Blanchard
Manager, Waste Management and Refuse
City of Sault Ste. Marie Public Works
128 Sackville Road
Sault Ste. Marie, Ontario
P6B 4T6

Attention: Mr. Mike Blanchard

Re: Analytical Results - Toxicity Characteristic Leachate Procedure (TCLP)
526 Bay Street, Sault Ste. Marie, Ontario

Dear Mr. Blanchard,

TULLOCH Engineering (TULLOCH) was retained by Brook McIlroy (Client) to determine disposal options for petroleum hydrocarbon (PHC) impacted soil removed during the soil remediation at 526 Bay Street East in Sault Ste. Marie, Ontario (herein referred to as the 'Site').

Samples of worse case soils were collected during a performance of a hand dug test pit in June 2021. A soil sample was collected from 0.7 metres below ground surface (mbgs), consisting of redish/grey silty sand. A sample was sent for analysis to classify the soils under Ontario Regulation 347 as amended to Ontario Regulation 558/00. The sample was submitted for laboratory analysis via the Toxicity Characteristic Leachate Procedure (TCLP) to determine whether the waste material is considered a "leachate toxic waste" in accordance with the regulation. Selected parameters for analysis (PCB, Metals, VOC, PAH and Ignitability) were chosen because of their potential presence based on the historical use of the Site.

The soil sample (TCLP) was relinquished to SGS Canada Inc. (SGS). SGS is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the International Standards ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories.

TULLOCH compared the results of SGS's analytical report, number CA15453-JUN21, with the corresponding allowable concentration as prescribed by the Schedule 4 Leachate Quality Criteria, established by Ontario Regulation 558/00. The following table illustrates the TCLP results in comparison with the Schedule 4 Leachate Quality Criteria.

Parameter	Units	RL[1]	Results	Schedule 4 Criteria[2]
Metals				
Mercury	mg/L	0.00001	< 0.00001	0.1
Arsenic	mg/L	0.002	< 0.002	2.5
Silver	mg/L	0.0005	< 0.0005	5
Barium	mg/L	0.0002	0.310	100
Boron	mg/L	0.02	0.06	500
Cadmium	mg/L	0.00003	0.00736	0.5
Chromium	mg/L	0.0008	0.0052	5
Lead	mg/L	0.00009	0.0947	5
Selenium	mg/L	0.0004	< 0.0004	1
Uranium	mg/L	0.00002	0.00029	10
Volatile Organic Compounds				
Vinyl Chloride	mg/L	0.008	<0.008	0.2
1,1 Dichloroethylene	mg/L	0.02	<0.02	1.4
Dichloromethane	mg/L	0.02	<0.02	5.0
Methyl Ethyl Ketone	mg/L	0.8	<0.8	200
Chloroform	mg/L	0.02	<0.02	10.0
1,2-Dichloroethane	mg/L	0.02	<0.02	0.5
Carbon Tetrachloride	mg/L	0.008	<0.008	0.5
Benzene	mg/L	0.02	<0.02	0.5
Trichloroethylene	mg/L	0.02	<0.02	5.0
Tetrachloroethylene	mg/L	0.02	<0.02	3.0
Chlorobenzene	mg/L	0.02	<0.02	8.0
1,2-Dichlorobenzene	mg/L	0.02	<0.02	20.0
1,4-Dichlorobenzene	mg/L	0.02	<0.02	0.5
PAHs				
Benzo-a-pyrene	mg/L	0.001	<0.001	0.001
Ignitability				
Ignitability	N/A	N/A	Non Flammable	N/A
Particle Size				
Particle Size (Description)	N/A	N/A	Silty Sand	N/A
PCBs				
PCBs	ug/L	0.001	<0.001	0.3

NOTES:

[1]RL means Reportable Detection Limit.

[2]Leachate Quality Criteria are prescribed by Schedule 4 of Ontario Regulation 558/00, Regulation (Amended O. Reg. 347), made under the Environmental Protection Act, dated March 31, 2001.

[3]The sum of Nitrate and Nitrite (as Nitrogen) cannot exceed 1,000 mg/L.

Shaded Cells – Represent results that exceed the Schedule 4 Leachate Quality Criteria.

Based on the analytical results, the soil sample meets the current Schedule 4 Leachate Quality Criteria and is **not** considered "leachate toxic waste". Therefore, the soil is classified as a **solid non-hazardous industrial waste,** which is considered acceptable for disposal at an Ontario Ministry of Environment and Climate Change registered waste disposal site.

At this time the exact quantity of soil to be excavated is unknown but is estimated to be between $25m^3$ to $75m^3$.

TULLOCH trusts the above information is complete and satisfactory for your requirements at this time; however, should you have any questions regarding the information provided, please call the undersigned directly at (705) 257-9600

Sincerely,
TULLOCH Engineering Inc.

Rod Morrison
Engineering Technologist
rod.morrison@tulloch.ca

Tyler Moody, A.Sc.T.
Project Manager
tyler.moody@tulloch.ca

Enclosed: SGS Canada Inc. Analytical report CA15453-Jun21

City of Sault Ste Marie - Waste Management Division

Soil Acceptance Application Form

The City of Sault Ste Marie Waste Management Facility accepts contaminated soils for daily cover or disposal, only after the results of lab analysis of the soil have been approved by City Staff. This soil acceptance application form is required to initiate the review process.

Please complete the application form and forward it along with supporting documents to:

Waste Management Division
City of Sault Ste Marie
128 Sackville Rd
Sault Ste Marie, ON P6B 4T5
Fax Number: (705) 759-5219

For further information, please contact Mike Blanchard at (705) 541-7087 or m.blanchard@cityssm.on.ca

Section A – Contact Information

Company Name: TULLOCH Engineering Inc.

Contact Person: Tyler Moody, A.Sc.T.

Address: 71 Black Road

Telephone: 705-949-1457 (Cell – 705-257-9600)

Fax: NA

Email: Tyler.moody@tulloch.ca

Submitted by:

Print Name: Tyler Moody, A.Sc.T.

Signature:

Date: 20/06/2021

Section B – Site Information

Source of Material Address: 526 Bay Street East

Current Land Use: Vacant commercial land

Historic Land Use: Commercial land (former garage and service station).

Section C – Material Information

Estimated Volume (tonne): Exact quantities are unknown. Estimated to be between 25 to 100 cubic metres

Source of Contamination: Gasoline from historical fuel dispensing activities on Site.

Specific Material Characteristics (soil type, porosity, particle size, etc.):

Silty sand, clay and sandstone till

Comments: Soils require removal from the Site due to construction of the downtown plaza

Section D – Chemical Acceptance Criteria

Appropriate Report of Analysis must be submitted with this application form, along with site and sample location plans. Chemical analysis must be sufficient in quantity and scope to represent all the material to be disposed of and all of the suspected contaminants. Analysis and criteria should be listed side by side, and any parameters in excess of the guidelines highlighted. A cover letter from the appropriate test facility/laboratory or engineering firm must accompany the test results and must indicate that the soil is non-hazardous as specified in Regulation 347 (as amended from time to time) and O.Reg. 558, Schedule 4 TCLP Leachate Criteria.

1. **For Use as Daily Cover:**
   - Soil must be granular in nature and not contain clay, mud or debris.

2. **For Disposal as Waste: ($70/tonne as per Waste Management By-law 2003-140)**
   - This material due to its composition cannot be used for daily cover.

Intended Use of Contaminated Material:

Daily Cover [x] **Disposal** [ ]

Disclaimer: The City of Sault Ste Marie reserves the right to reject an application/load (even if soil criteria are met) in order to protect leachate quality, address landfill capacity concerns, to comply with Certificate of Approval limitations and other regulations, etc.

For Office Use Only:

Accepted Direction: Daily Cover [ ] Disposal [ ] Stock Pile (Clay) [ ] Denied [ ]

WM Staff Approval: _____ Date: _____

Copy to: Deputy Commissioner of PWT

SGS

FINAL REPORT

CA15453-JUN21 R

21-1339

Prepared for

Tulloch Engineering

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Tulloch Engineering	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	71 Black Road, Unit 8 Sault Ste. Marie, Ontario P6B 0A3. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Nick Conte	Telephone	705-652-2143
Telephone	705-949-1457	Facsimile	705-652-6365
Facsimile		Email	brad.moore@sgs.com
Email	nicholas.conte@tulloch.ca;tyler.moody@tulloch.ca	SGS Reference	CA15453-JUN21
Project	21-1339	Received	06/18/2021
Order Number		Approved	06/24/2021
Samples	Leachate (1)	Report Number	CA15453-JUN21 R
		Date Reported	06/24/2021

COMMENTS

Temperature of Sample upon Receipt: 2 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:022238

TCLP metals reported at 10x DL

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

First Page..... 1
Index..... 2
Results..... 3-7
Exceedance Summary..... 8
QC Summary..... 9-15
Legend..... 16
Annexes..... 17

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Nick Conte
Samplers: Nicholas Conte

PACKAGE: REG558 - Acid rock Drainage (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6
				Sample Name	TCLP
				Sample Matrix	Leachate
				Sample Date	17/06/2021
Parameter	**Units**	**RL**	**L1**		**Result**
Acid rock Drainage					
Final pH	no unit	0.01			4.95

PACKAGE: REG558 - Metals and Inorganics (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

				Sample Number	6
				Sample Name	TCLP
				Sample Matrix	Leachate
				Sample Date	17/06/2021
Parameter	**Units**	**RL**	**L1**		**Result**
Metals and Inorganics					
Sample weight	g	0.001			100
Ext Fluid	#1 or #2	0.01			1
Ext Volume	mL	0.01			2000
Ignitability	yes/no	-			No
Burn Rate	mm/S	1.6			< 1.6
Nitrite (as N)	as N mg/L	0.3			< 0.3
Nitrate (as N)	as N mg/L	0.6			< 0.6
Nitrate + Nitrite (as N)	as N mg/L	0.6	1000		< 0.6
Fluoride	mg/L	0.06	150		0.08
Cyanide (total)	mg/L	0.01	20		< 0.01
Arsenic	mg/L	0.002	2.5		< 0.002
Silver	mg/L	0.0005	5		< 0.0005
Barium	mg/L	0.0002	100		0.310

PACKAGE: **REG558 - Metals and Inorganics** (LEACHATE)

Sample Number	6
Sample Name	TCLP
Sample Matrix	Leachate
Sample Date	17/06/2021

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Boron	mg/L	0.02	500	0.06
Cadmium	mg/L	0.00003	0.5	0.00736
Chromium	mg/L	0.0008	5	0.0052
Lead	mg/L	0.00009	5	0.0947
Selenium	mg/L	0.0004	1	< 0.0004
Uranium	mg/L	0.00002	10	0.00029

PACKAGE: **REG558 - Other (ORP)** (LEACHATE)

Sample Number	6
Sample Name	TCLP
Sample Matrix	Leachate
Sample Date	17/06/2021

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Parameter	Units	RL	L1	Result
Other (ORP)				
Mercury	mg/L	0.00001	0.1	< 0.00001

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Nick Conte
Samplers: Nicholas Conte

PACKAGE: **REG558 - PCBs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

			Sample Number	6
			Sample Name	TCLP
			Sample Matrix	Leachate
			Sample Date	17/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**
PCBs				
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.001	0.3	< 0.001

PACKAGE: **REG558 - SVOCs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

			Sample Number	6
			Sample Name	TCLP
			Sample Matrix	Leachate
			Sample Date	17/06/2021
Parameter	**Units**	**RL**	**L1**	**Result**
SVOCs				
N-Nitrosodimethylamine	mg/L	0.0009	0.0009	< 0.0009
2,4-Dichlorophenol	mg/L	0.05	90	< 0.05
2,4,5-Trichlorophenol	mg/L	0.05	400	< 0.05
2,4,6-Trichlorophenol	mg/L	0.05	0.5	< 0.05
2,3,4,6-Tetrachlorophenol	mg/L	0.05	10	< 0.05
Pentachlorophenol	mg/L	0.05	6	< 0.05
Hexachlorobenzene	mg/L	0.05	0.13	< 0.05
Hexachlorobutadiene	mg/L	0.05	0.5	< 0.05
Hexachloroethane	mg/L	0.05	3	< 0.05
Nitrobenzene	mg/L	0.05	2	< 0.05
2,4-Dinitrotoluene	mg/L	0.05	0.13	< 0.05
3-, 4-Methylphenol	mg/L	0.05	200	< 0.05
2-Methylphenol	mg/L	0.05	200	< 0.05
Pyridine	mg/L	0.1	5	< 0.1

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Nick Conte
Samplers: Nicholas Conte

PACKAGE: **REG558 - SVOCs - PAHs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

	Sample Number	6
	Sample Name	TCLP
	Sample Matrix	Leachate
	Sample Date	17/06/2021

Parameter	Units	RL	L1	Result
SVOCs - PAHs				
Benzo(a)pyrene	mg/L	0.001	0.001	< 0.001

PACKAGE: **REG558 - VOCs** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

	Sample Number	6
	Sample Name	TCLP
	Sample Matrix	Leachate
	Sample Date	17/06/2021

Parameter	Units	RL	L1	Result
VOCs				
Methyl ethyl ketone	mg/L	0.8	200	< 0.8
Vinyl Chloride	mg/L	0.008	0.2	< 0.008
Dichloromethane	mg/L	0.02	5	< 0.02
Chloroform	mg/L	0.02	10	< 0.02
Trichloroethylene	mg/L	0.02	5	< 0.02
Tetrachloroethene	mg/L	0.02	3	< 0.02
Monochlorobenzene	mg/L	0.02	8	< 0.02
Carbon tetrachloride	mg/L	0.008	0.5	< 0.008
1,2-Dichlorobenzene	mg/L	0.02	20	< 0.02
1,4-Dichlorobenzene	mg/L	0.02	0.5	< 0.02
1,2-Dichloroethane	mg/L	0.02	0.5	< 0.02
1,1-Dichloroethylene	mg/L	0.02	1.4	< 0.02

Client: Tulloch Engineering
Project: 21-1339
Project Manager: Nick Conte
Samplers: Nicholas Conte

PACKAGE: **REG558 - VOCs - BTEX** (LEACHATE)

L1 = REG558 / LEACHATE / - - SCHEDULE 4 - -

Sample Number	6
Sample Name	TCLP
Sample Matrix	Leachate
Sample Date	17/06/2021

Parameter	Units	RL	L1	Result
VOCs - BTEX				
Benzene	mg/L	0.02	0.5	< 0.02

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-[ENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Cyanide (total)	SKA0224-JUN21	mg/L	0.01	<0.01	ND	10	94	90	110	NV	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Fluoride	EWL0444-JUN21	mg/L	0.06	<0.06	ND	10	101	90	110	97	75	125

Inorganics-General

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Mercury	EHG0027-JUN21	mg/L	0.00001	< 0.00001	8	20	116	80	120	124	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 I Internal ref.: ME-CA-[ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Silver	EMS0138-JUN21	mg/L	0.0005	<0.00005	ND	20	103	90	110	114	70	130
Arsenic	EMS0138-JUN21	mg/L	0.002	<0.0002	20	20	103	90	110	109	70	130
Barium	EMS0138-JUN21	mg/L	0.0002	<0.00002	3	20	102	90	110	104	70	130
Boron	EMS0138-JUN21	mg/L	0.02	<0.002	6	20	107	90	110	NV	70	130
Cadmium	EMS0138-JUN21	mg/L	0.00003	<0.000003	ND	20	101	90	110	117	70	130
Chromium	EMS0138-JUN21	mg/L	0.0008	<0.00008	ND	20	106	90	110	118	70	130
Lead	EMS0138-JUN21	mg/L	0.00009	<0.00001	ND	20	110	90	110	111	70	130
Selenium	EMS0138-JUN21	mg/L	0.0004	<0.00004	20	20	107	90	110	109	70	130
Uranium	EMS0138-JUN21	mg/L	0.00002	<0.000002	1	20	101	90	110	NV	70	130

Nitrate by Ion Chromatography

Method: EPA300/MA300-Ions1.3 I Internal ref.: ME-CA-[ENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Nitrate (as N)	DIO0382-JUN21	mg/L	0.6	<0.6	0	20	101	90	110	94	75	125

QC SUMMARY

Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENV]IC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Nitrite (as N)	DIO0382-JUN21	mg/L	0.3	<0.3	0	20	97	90	110	98	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Polychlorinated Biphenyls (PCBs) - Total	GCM0378-JUN21	mg/L	0.001	< 0.001	NSS	30	86	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
2,3,4,6-Tetrachlorophenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	91	50	140	NSS	50	140
2,4,5-Trichlorophenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	81	50	140	NSS	50	140
2,4,6-Trichlorophenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	79	50	140	NSS	50	140
2,4-Dichlorophenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	91	50	140	NSS	50	140
2,4-Dinitrotoluene	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	91	50	140	NSS	50	140
2-Methylphenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	80	50	140	NSS	50	140
3-, 4-Methylphenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	73	50	140	NSS	50	140
Benzo(a)pyrene	GCM0380-JUN21	mg/L	0.001	< 0.001	NSS	30	92	50	140	NSS	50	140
Hexachlorobenzene	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	84	50	140	NSS	50	140
Hexachlorobutadiene	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	64	50	140	NSS	50	140
Hexachloroethane	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	73	50	140	NSS	50	140
Nitrobenzene	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	92	50	140	NSS	50	140
Pentachlorophenol	GCM0380-JUN21	mg/L	0.05	< 0.05	NSS	30	82	50	140	NSS	50	140
N-Nitrosodimethylamine	GCM0385-JUN21	mg/L	0.0009	< 0.0009	NSS	30	37	20	130	NSS	20	130
Pyridine	GCM0385-JUN21	mg/L	0.1	< 0.1	NSS	30	59	30	130	NSS	30	130

QC SUMMARY

Total Nitrate/Nitrite by Ion Chromatography

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-[ENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
Nitrate + Nitrite (as N)	DIO0382-JUN21	mg/L	0.6	<0.6	NA	20	NA	80	120	NA	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High	Spike Recovery (%)	Recovery Limits (%) Low	Recovery Limits (%) High
1,1-Dichloroethylene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	94	60	130	95	50	140
1,2-Dichlorobenzene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	96	60	130	101	50	140
1,2-Dichloroethane	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	95	60	130	95	50	140
1,4-Dichlorobenzene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	98	60	130	102	50	140
Benzene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	96	60	130	99	50	140
Carbon tetrachloride	GCM0383-JUN21	mg/L	0.008	<0.008	ND	30	93	60	130	96	50	140
Chloroform	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	93	60	130	95	50	140
Dichloromethane	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	94	60	130	95	50	140
Methyl ethyl ketone	GCM0383-JUN21	mg/L	0.8	<0.8	ND	30	99	50	140	94	50	140
Monochlorobenzene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	96	60	130	100	50	140
Tetrachloroethene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	100	60	130	101	50	140
Trichloroethylene	GCM0383-JUN21	mg/L	0.02	<0.02	ND	30	97	60	130	99	50	140
Vinyl Chloride	GCM0383-JUN21	mg/L	0.008	<0.008	ND	30	86	50	140	87	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 022238 Page 1 of 1

Laboratory Information Section - Lab use only

Received By: Colin Daub
Received Date: 06 / 18 / 2021 (mm/dd/yy)
Received Time: 10 : 00 (hr : min)
Received By (signature):
Custody Seal Present: Yes [X] No [ ]
Custody Seal Intact: Yes [X] No [ ]
Cooling Agent Present: Yes [X] No [ ] Type: Ice
Temperature Upon Receipt (°C) 1.2.3
CA15453 - Jun 21
LAB LIMS #:

REPORT INFORMATION	INVOICE INFORMATION
Company: Tulloch Eng.	[X] (same as Report Information)
Contact: Nicholas Conte	Company:
Address: 71 Black Rd Sault Ste. Marie, ON	Contact:
Phone: 705-975-0913	Address:
Fax:	Phone:
Email: nicholas.conte@tulloch.ca tyler.moody@tulloch.ca	Email:

Quotation #: P.O. #:
Project #: 21-1339 Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

[ ] Regular TAT (5-7days) TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): [ ] 1 Day [ ] 2 Days [ ] 3 Days [X] 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

[ ] O.Reg 153/04 [ ] O.Reg 406/19
[ ] Table 1 [ ] Res/Park Soil Texture:
[ ] Table 2 [ ] Ind/Com [ ] Coarse
[ ] Table 3 [ ] Agri/Other [ ] Medium/Fine
[X] Table TCLP Leachate.
Soil Volume [ ] <350m3 [ ] >350m3

Other Regulations: [ ] Reg 347/558 (3 Day min TAT) [ ] PWQO [ ] MMER [ ] CCME [ ] Other: [ ] MISA [ ] ODWS Not Reportable *See note

Sewer By-Law: [ ] Sanitary [ ] Storm Municipality:

RECORD OF SITE CONDITION (RSC) [ ] YES [ ] NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1	TCLP	June 17, '21	11:30	4	S
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

	Field Filtered (Y/N)	Metals & Inorganics incl CrVI, CN, Hg, pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	Full Metals Suite ICP metals plus B(HWS-soil only) Hg, CrVI	ICP Metals only Sb,As,Ba,Be,B,Cd,Cr,Co,Cu,Pb,Mo,Ni,	M&I	PAHs only	SVOCs all incl PAHs, ABNs, CPs	SVOC	PCBs [ ] Total [ ] Aroclor	PCB	F1-F4 + BTEX	F1-F4 only no BTEX	PHC	VOCs all incl BTEX	VOC	BTEX only	Pesticides Organochlorine or specify other	Pest	Other (please specify)					Appendix 2: 406/19 Leachate Screening Levels Table :	Sewer Use: Specify pkg:	Water Characterization Pkg [ ] Extended [ ] General	TCLP	COMMENTS:
1																									X	

TCLP tests: [X] M&I [X] VOC [X] PCB [X] B(a)P [X] ABN [X] Hgnit.

Observations/Comments/Special Instructions

332967046779 ct- 9:30 s

Sampled By (NAME): Nicholas Conte Signature: Date: June / 17 / 2021 (mm/dd/yy)
Relinquished by (NAME): Nicholas Conte Signature: Date: June / 17 / 2021 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.4
Date of Issue: 22 May 2020

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

TULLOCH
ENGINEERING

71 Black Road
Unit 8
Sault Ste. Marie,
ON
P6B 0A3

T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602

saultstemarie@TULLOCH.ca

February 19, 2020
19-1866

Attn: Mr. Colin Berman
Brook McIlroy
161 Spadina Ave, 2nd Floor
Toronto, ON

by e-mail: cberman@brookmcilroy.com

RE: Environmental Screening of Geotechnical Investigation Soil Samples for the Downtown Civic Plaza in Sault Ste. Marie, ON

Dear Mr. Berman:

TULLOCH Engineering Inc. (TULLOCH) was retained by Brook McIlroy to screen soil samples collected during the Geotechnical Site Investigation performed for the new Downtown Civic Plaza located on and adjacent to Bingham Street in Sault Ste. Marie, Ontario (Site). The boreholes were chosen and advanced based on the selected locations for representative geotechnical sampling and testing. The soil screening program was initiated to screen samples collected during the geotechnical investigation within the existing parking areas and commercial property prior to development. This screening program is not intended to characterise the overall environmental condition of the Site.

Field Work and Sample Collection

Field sampling was completed in accordance with the Ministry of Environment, Conservation and Parks (MECP) document entitled "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", dated December 1996 (MECP Sampling Guidelines).

The encountered stratigraphy (e.g., major soil types, colour and moisture), as well as visual and olfactory evidence of potential environmental contamination was noted. Measurement of headspace vapour concentrations were taken from each soil sample recovered using portable hydrocarbon detection instrument (RKI Eagle) to measure total combustible organic vapours (COVs).

The samples collected from the Site were submitted to Testmark Laboratories in Sudbury, Ontario, which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the "International Standards ISO/IEC 17025 – General Requirement for the Competence of Testing and Calibration Laboratories", dated December 15, 1999. All analyses used the analytical methods prescribed in the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", as amended.

The Site is a commercial property located in Sault Ste. Marie, Ontario. It is TULLOCH's understanding that potable water for the surrounding area is supplied through municipal services (non-potable). The Site is not within one of the well catchment intake zones within the city of Sault Ste. Marie from the review of the *Approved Source Protection Plan, Sault Ste. Marie Region*, Updated January 2017.

The results of the soil analyses were compared to the generic criteria described in the MECP's "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011" under O. Reg. 153/04 (O. Reg. 153/04), as amended by O.Reg.511/09.

Soil depths in the boreholes varies with some shallower and some deeper than 2 meters below ground surface (mbgs). When shallow bedrock (less than 2.0 mbgs) is encountered the appropriate soil condition standards (SCS) must be applied to the Site.

Ontario Regulation 153/04 (as amended) states that a Site is classified as an "environmentally sensitive area" if the pH of the surface soil (less than 1.5 mbgs) is less than 5 or greater than 9, the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the Site is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. After reviewing the laboratory data, the pH value of the surface soil sample collected on-Site was inside of the limits for surface soil for non-sensitive sites. The Site is also not an area of natural significance and it is not adjacent to, nor does it contain land within 30 metres of, an area of natural significance. As such, the Site is not considered to be an environmentally sensitive area based on the pH value.

It is TULLOCH's understanding the that existing commercial use of the Site is being retained. If the land use is to be changed from a less restrictive (commercial) to more restrictive use (parkland) a Record of Site Condition may be required.

Based on the above, the appropriate MECP SCS for the Site are Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for coarse-textured soils and commercial property use.

As such, all analytical results have been compared to the *Table 7 SCS.*

Soil Sampling

Based on the screening of the eight geotechnical boreholes, a total of four 'worst case' soil samples were collected from four of the boreholes. Some of the boreholes exhibited signs of potential contaminants based on field screening and were submitted for laboratory analysis of Petroleum Hydrocarbon (PHCs) (F1-F4), Volatile Organic Compounds (VOCs) and Polyaromatic Hydrocarbons (PAHs). Samples collected for analysis, along with their respective locations and parameters, are listed in the Analytical Tables found in the enclosed document.

Sample BH1 collected at 0-0.76 mbgs exceeded the Table 7 SCS for the following PAH parameters:

- Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-c,d)pyrene and Phenanthrene.

All remaining PAH, PHC (F1-F4) and VOC parameters met the Table 7 SCS. BH1 AS1, BH6 AS1 and BH8 SS5 had low levels of PHC F1-F4 but they met the Table 7 SCS. Further investigations are required to identify the potential source and/or cause of the impacts.

BH2 could not be sampled at a depth of 0.76 mbgs to 2.1 mbgs due to loss of spilt spoon samples. A void was encountered and should be investigated as part of any further Site work.

Conclusions

The environmental soil screening program was not completed as part of a Phase I or Phase II Environmental Site Assessment (ESA), and should not be considered to be representative of the overall environmental condition of the Site. Specific areas of environmental concern not reported to TULLOCH or specifically targeted as part of this soil screening program. The reported results of this screening program are only representative of the "worse case" soils collected from the borehole locations selected for geotechnical purposes.

Soil sample BH1 at a depth of 0 – 0.76 m was found to have PAH exceedances when compared to the applicable Table 7 SCS for the following PAH parameters:

- Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, and Phenanthrene.

All remaining PAH, PHC (F1-F4) and VOC parameters met the Table 7 SCS. BH1 AS1, BH6 AS1 and BH8 SS5 had low levels of PHC F1-F4 but they met the Table 7 SCS. Further investigations are required to identify the potential source and/or cause of the impacts. BH2 could not be sampled at a depth of 0.76 mbgs to 2.1 mbgs due to loss of spilt spoon samples. A void was encountered and should be investigated as part of any further Site work.

Further investigations are required to identify the potential source and extent of the identified impacts. It is recommended that a Phase I ESA be conducted on the Site to determine if there are any additional areas of potential environmental concern.

Should you have any questions concerning this letter, please do not hesitate to contact the undersigned.

Sincerely,

TULLOCH Engineering, Inc.

Rod Morrison
Engineering Technologist

Tyler Moody
Project Manager

Cc: Robert Bressan, P.Eng., FEC

Enclosed; 1 document, 20 pages
Testmark Analytical Results 390254 – Dated December 19, 2019

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Client:	Rod Morrison	Work Order Number:	390254
Company:	Tulloch Engineering-Sault Ste. Marie	PO #:	
Address:	71 Black Road Sault Ste. Marie, ON, P6B 0A3	Regulation: Project #:	O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse) 19-1866
Phone/Fax:	(705) 949-1457 / (705) 949-9606	DWS #:	
Email:	rod.morrison@tulloch.ca	Sampled By:	Rod Morrison
Date Order Received:	12/12/2019	Analysis Started:	12/13/2019
Arrival Temperature:	5 °C	Analysis Completed:	12/20/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH1 AS1	1504218	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	12/10/2019	
BH3 AS1	1504219	Soil	None		12/10/2019	
BH6 AS1	1504220	Soil	None		12/10/2019	
BH8 SS5	1504221	Soil	None		12/10/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Anions Soil (A5)	Garson	Determination of Anions in Soil	Modified from SW846-9056A
BTEX/F1 Soil (A127)	Garson	Determination of PHC BTEX/F1 in Soil - Tier 1 CCME	Modified from CWS PHC Tier I CCME
Cond Soil (R12)	Garson	Determination of conductivity in soil (1:2)	Modified from EPA SW846-9050A
Moisture (A99)	Garson	Determination of Percent Moisture	In-House
PAH+ Soil SIM (A41)	Garson	Determination of PAH in Soil by GC/MS	Modified from SW846-8270D
pH Soil (R2)	Garson	Determination of soil pH by Ion Selective Electrode	Modified from EPA SW-846 9045D
PHC F2-F4 Soil (A59)	Garson	Determination of PHC (F2-F4) in Soil - Tier 1 CCME by GC/FID	Modified from CWS PHC Tier I CCME
PHC F2-F4 Soil - PAH (A59)	Garson	Calculation of PHC F2-F4 With PAHs Subtracted	Modified from CWS PHC Tier I CCME

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Method	Lab	Description	Reference
RedOx - Soil (T06)	Mississauga	Determination of RedOx Potential of Soil	Modified from APHA-2580B
Resistivity Soil (R12)	Garson	Determination of Resistivity in Soil (1:2)	Modified from Carter 18.3
Sulphide/S (R98)	Garson	Determination of Sulphide in Soil	In-House
VOC Methanol Soil (A14)	Garson	Determination of Volatile Organic Compounds in Soil by P&T/GC/MS	Modified from SW846 M8260

REPORT COMMENTS

Report revised to change the regulation from Table 1 to Table 7 as per clients request. 02/14/20 KJM

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

WORK ORDER RESULTS

Sample Description	BH8 SS5			
Sample Date	12/10/2019 12:00 AM			
Lab ID	1504221			
Anions	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
Bromide	<0.2 [<0.2]	0.2	µg/g	~
Chloride	47.1 [41.0]	0.4	µg/g	~
Fluoride	1.3 [1.0]	0.2	µg/g	~
Nitrate (as N)	<0.2 [<0.2]	0.2	µg/g	~
Nitrite (as N)	<0.1 [<0.1]	0.1	µg/g	~
Sulphate	14 [12]	2	µg/g	~

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
% Moisture	16.2	0.1	4.3	0.1	3.8	0.1	11.5	0.1	%	~
Conductivity							171 [168]	1	µS/cm	700
pH	7.48 [7.51]	N/A					7.5	N/A	pH	~
RedOx (vs. S.H.E.)							227 [226]	N/A	mV	~
Resistivity							5860	N/A	ohm-cm	~

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
Sulphide							<5 [<5]	5	µg/g	-

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
PAH	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
1+2-Methylnaphthalene (Calc.)	1.31	0.03	<0.03	0.03	<0.02	0.02	<0.02	0.02	µg/g	0.99
Acenaphthene	1.69	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	7.9
Acenaphthylene	0.56	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.15
Anthracene	1.92	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.67
Benzo(a)anthracene	7.6	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	0.5
Benzo(a)pyrene	2.6	0.2	<0.02	0.02	<0.02	0.02	0.01	0.01	µg/g	0.3
Benzo(b)fluoranthene	6.9	0.2	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.78
Benzo(ghi)perylene	1.88	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	6.6
Benzo(k)fluoranthene	2.04	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.78
Chrysene	5.7	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	7
Dibenz(a,h)anthracene	0.44	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.1
Fluoranthene	13.0	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	0.69
Fluorene	2.11	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	62
Indeno(1,2,3-c,d)pyrene	1.75	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.38

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
PAH	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
Naphthalene	2.16	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.6
Phenanthrene	14.4	0.2	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	6.2
Pyrene	10.3	0.2	<0.02	0.02	<0.02	0.02	0.01	0.01	µg/g	78

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
Petroleum Hydrocarbons (Soil)	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
F1 (C6-C10) Incl. BTEX	3	2	<2	2	2	2	2	2	µg/g	~
F2 (C10-C16)	9	4	<4	4	6	5	3	3	µg/g	98
F2 (C10-C16)-Napth (Calc.)	6	2	<1	1	6	1	3	2	µg/g	~
F3 (C16-C34)	79	10	11	10	93	10	40	7	µg/g	300
F3 (C16-C34)-PAH (Calc.)	20	4	11	3	93	3	40	4	µg/g	~
F4 (C34-C50)	166	10	18	10	301	10	146	10	µg/g	2800
F4 (C34-C50) (Calc.)	166	5	18	5	301	5	146	5	µg/g	2800
Baseline @ C50	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A	NA	~
o-Terphenyl (Surr.)	108	N/A	83.6	N/A	88.1	N/A	88.5	N/A	% Rec	~
undecane (Surr.)	106	N/A	95.3	N/A	104	N/A	101	N/A	% Rec	~

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
Benzene	<0.02 [<0.02]	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.21
Ethylbenzene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	2
Toluene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	2.3
m+p-Xylene	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	~
o-Xylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	~
Total Xylenes (Calc.)	<0.04 [<0.04]	0.04	<0.02	0.02	<0.02	0.02	<0.03	0.03	µg/g	3.1
1,1,1,2-Tetrachloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.058
1,1,1-Trichloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.38
1,1,2,2-Tetrachloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,1,2-Trichloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,1-Dichloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	3.5
1,1-Dichloroethylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,2-Dibromoethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,2-Dichlorobenzene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	3.4
1,2-Dichloroethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,2-Dichloroethane-d4 (Surr)	135 [80.9]	N/A	101	N/A	135	N/A	135	N/A	% Rec	~

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
Volatile Organic Compounds	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
1,2-Dichloropropane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
1,3-Dichlorobenzene	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	4.8
1,4-Dichlorobenzene	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	0.083
1-Bromo-4-fluorobenzene (Surr.)	94.4 [90.7]	N/A	97.1	N/A	95.4	N/A	95.8	N/A	% Rec	-
Acetone	<0.5 [<0.5]	0.5	<0.3	0.3	<0.3	0.3	<0.4	0.4	µg/g	16
Bromodichloromethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	13
Bromoform	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.27
Bromomethane	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	0.05
Carbon tetrachloride	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
Chlorobenzene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	2.4
Chloroform	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
cis - + trans-1,3-Dichloropropene (Calc.)	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.05
cis-1,2-Dichloroethylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	3.4
cis-1,3-Dichloropropene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	-
Dibromochloromethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	9.4
Dichlorodifluoromethane	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	16

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
Volatile Organic Compounds	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 7 Soil Res/Park/Inst (Coarse)
Dichloromethane	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	0.1
Methyl ethyl ketone	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	16
Methyl isobutyl ketone (MIBK)	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	1.7
Methyl tert-butyl ether (MTBE)	<0.05 [<0.05]	0.05	<0.03	0.03	<0.03	0.03	<0.04	0.04	µg/g	0.75
n-Hexane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	2.8
Styrene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.7
Tetrachloroethylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.28
Toluene-d8 (Surr.)	102 [98]	N/A	98.9	N/A	100	N/A	99.7	N/A	% Rec	~
Trans-1,2-dichloroethylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.084
Trans-1,3-dichloropropene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	~
Trichloroethylene	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	0.061
Trichlorofluoromethane	<0.03 [<0.03]	0.03	<0.02	0.02	<0.02	0.02	<0.02	0.02	µg/g	4
Vinyl chloride	<0.02 [<0.02]	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.02

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. If multiple re-runs exist they are suffixed by a number. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

LCL: Lower Control Limit.

UCL: Upper Control Limit.

QAQCID: This is a unique reference to the quality control data set used to generate the reported value. Contact our lab for this information, as it is traceable through our LIMS.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

QUALITY CONTROL DATA

THIS SECTION REPORTS QC RESULTS ASSOCIATED WITH THE TEST BATCH; THESE ARE NOT YOUR SAMPLE RESULTS.
QAQC details include only values where sufficient sample data allowed measurement.

Anions

Blank: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	0.2	µg/g	0	<0.2	0.6	20191217.A5G
Chloride	0.4	µg/g	0	<0.4	1.2	20191217.A5G
Fluoride	0.02	µg/g	0	<0.02	0.6	20191217.A5G
Nitrate (as N)	0.2	µg/g	0	<0.2	0.6	20191217.A5G
Nitrite (as N)	0.1	µg/g	0	<0.1	0.18	20191217.A5G
Sulphate	0.4	µg/g	0	<0.4	6	20191217.A5G

Positive Control: LFB-5 (0.1/0.02/0.002 mg/g equiv) (5)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	84.8	120	20191217.A5G
Chloride	N/A	%	80	105	120	20191217.A5G
Fluoride	N/A	%	80	97.8	120	20191217.A5G
Nitrate (as N)	N/A	%	80	99.9	120	20191217.A5G
Nitrite (as N)	N/A	%	80	105	120	20191217.A5G
Sulphate	N/A	%	80	93	120	20191217.A5G

Positive Control: LFB-7 (0.2/0.1/0.02 mg/g equiv) (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	92	120	20191217.A5G
Chloride	N/A	%	80	104	120	20191217.A5G
Fluoride	N/A	%	80	101	120	20191217.A5G
Nitrate (as N)	N/A	%	80	98.4	120	20191217.A5G
Nitrite (as N)	N/A	%	80	94.5	120	20191217.A5G
Sulphate	N/A	%	80	107	120	20191217.A5G

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Chloride	N/A	%	0	13.8	35	20191217.A5G

General Chemistry

Calibration Check: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	N/A	%	475	497	525	20191219.TM-G.R12B

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	1	µS/cm	0	<1	5	20191219.TM-G.R12B

Positive Control: LCS (pH 8) (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH	N/A	pH	7.8	7.95	8.2	20191219.TM-G.R2B

Positive Control: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Sulphide	0.02	µg/g	0	<0.02	0.06	20191219.R98B

Positive Control: ORP Control 240 (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)	N/A	mV	220	244	260	20191219.TM-M.A6B

Sample Replicate: % RPD (3)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH		pH	0	0.03	0.3	20191219.TM-G.R2B

Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity		%	0	1.8	10	20191219.TM-G.R12B

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Replicate: % RPD (9)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)		%	0	0.4	10	20191219.TM-M.A6B

PAH

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(b)fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(ghi)perylene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(k)fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Chrysene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Dibenz(a,h)anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Fluorene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Indeno(1,2,3-c,d)pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Naphthalene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Phenanthrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs

Positive Control: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	% Rec	50	84.2	140	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	% Rec	50	74	140	20191216.TM-G.A41PAHs
Anthracene	0.01	% Rec	50	71	140	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	% Rec	50	138	140	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	% Rec	50	52.6	140	20191216.TM-G.A41PAHs

Benzo(b)fluoranthene	0.01	% Rec	50	103	140	20191216.TM-G.A41PAHs
Benzo(ghi)perylene	0.01	% Rec	50	62	140	20191216.TM-G.A41PAHs
Benzo(k)fluoranthene	0.01	% Rec	50	116	140	20191216.TM-G.A41PAHs
Chrysene	0.01	% Rec	50	114	140	20191216.TM-G.A41PAHs
Dibenz(a,h)anthracene	0.01	% Rec	50	78.8	140	20191216.TM-G.A41PAHs
Fluoranthene	0.01	% Rec	50	85	140	20191216.TM-G.A41PAHs
Fluorene	0.01	% Rec	50	86.4	140	20191216.TM-G.A41PAHs
Indeno(1,2,3-c,d)pyrene	0.01	% Rec	50	72.6	140	20191216.TM-G.A41PAHs
Naphthalene	0.01	% Rec	50	70.8	140	20191216.TM-G.A41PAHs
Phenanthrene	0.01	% Rec	50	73	140	20191216.TM-G.A41PAHs
Pyrene	0.01	% Rec	50	82.6	140	20191216.TM-G.A41PAHs

Positive Control: LFSM (21)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	% Rec	50	87.2	140	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	% Rec	50	79.2	140	20191216.TM-G.A41PAHs
Anthracene	0.01	% Rec	50	75.2	140	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	% Rec	50	135	140	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	% Rec	50	58.8	140	20191216.TM-G.A41PAHs
Benzo(b)fluoranthene	0.01	% Rec	50	113	140	20191216.TM-G.A41PAHs
Benzo(ghi)perylene	0.01	% Rec	50	73.2	140	20191216.TM-G.A41PAHs
Benzo(k)fluoranthene	0.01	% Rec	50	120	140	20191216.TM-G.A41PAHs
Chrysene	0.01	% Rec	50	137	140	20191216.TM-G.A41PAHs
Dibenz(a,h)anthracene	0.01	% Rec	50	90.8	140	20191216.TM-G.A41PAHs
Fluoranthene	0.01	% Rec	50	91.2	140	20191216.TM-G.A41PAHs
Fluorene	0.01	% Rec	50	87.2	140	20191216.TM-G.A41PAHs
Indeno(1,2,3-c,d)pyrene	0.01	% Rec	50	82.2	140	20191216.TM-G.A41PAHs
Naphthalene	0.01	% Rec	50	64.2	140	20191216.TM-G.A41PAHs
Phenanthrene	0.01	% Rec	50	74.4	140	20191216.TM-G.A41PAHs
Pyrene	0.01	% Rec	50	89.6	140	20191216.TM-G.A41PAHs

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Positive Control: LFSMD (22)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	% Rec	50	78	140	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	% Rec	50	67.4	140	20191216.TM-G.A41PAHs
Anthracene	0.01	% Rec	50	70	140	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	% Rec	50	139	140	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	% Rec	50	50.4	140	20191216.TM-G.A41PAHs
Benzo(b)fluoranthene	0.01	% Rec	50	107	140	20191216.TM-G.A41PAHs
Benzo(ghi)perylene	0.01	% Rec	50	61.2	140	20191216.TM-G.A41PAHs
Benzo(k)fluoranthene	0.01	% Rec	50	112	140	20191216.TM-G.A41PAHs
Chrysene	0.01	% Rec	50	111	140	20191216.TM-G.A41PAHs
Dibenz(a,h)anthracene	0.01	% Rec	50	83	140	20191216.TM-G.A41PAHs
Fluoranthene	0.01	% Rec	50	87.6	140	20191216.TM-G.A41PAHs
Fluorene	0.01	% Rec	50	82.2	140	20191216.TM-G.A41PAHs
Indeno(1,2,3-c,d)pyrene	0.01	% Rec	50	74.8	140	20191216.TM-G.A41PAHs
Naphthalene	0.01	% Rec	50	58.4	140	20191216.TM-G.A41PAHs
Phenanthrene	0.01	% Rec	50	70.2	140	20191216.TM-G.A41PAHs
Pyrene	0.01	% Rec	50	85.8	140	20191216.TM-G.A41PAHs

Petroleum Hydrocarbons (Soil)

Calibration Check: IVS-1000-DIESEL (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F2 (C10-C16)	N/A	ppm	400	754	800	20191216.TM-G.A59F2s
F3 (C16-C34)	N/A	ppm	100	198	500	20191216.TM-G.A59F2s

Method Blank: LRB-1 (Blank) (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F2 (C10-C16)	40	mg/kg	0	<40	200	20191216.TM-G.A59F2s
F3 (C16-C34)	100	mg/kg	0	<100	400	20191216.TM-G.A59F2s
F4 (C34-C50)	100	mg/kg	0	<100	550	20191216.TM-G.A59F2s
o-Terphenyl (Surr.)	N/A	% Rec	60	83	140	20191216.TM-G.A59F2s

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F1 (C6-C10) Incl. BTEX	2	µg/g	0	<2	2	20191216.TM-G.A127s
undecane (Surr.)	N/A	% Rec	60	105	140	20191216.TM-G.A127s

Positive Control: LC-250-BTEX (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
undecane (Surr.)	N/A	% Rec	60	102	140	20191216.TM-G.A127s

Positive Control: LC-750-BTEX (3)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
undecane (Surr.)	N/A	% Rec	60	97.9	140	20191216.TM-G.A127s

Positive Control: LC-FUEL-F1 (4)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F1 (C6-C10) Incl. BTEX	20	%	60	102	140	20191216.TM-G.A127s
undecane (Surr.)	N/A	% Rec	60	106	140	20191216.TM-G.A127s

Positive Control: LFB-5 (1800 ug/g) (5)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F2 (C10-C16)	50	mg/kg	300	606	700	20191216.TM-G.A59F2s
F3 (C16-C34)	100	mg/kg	700	731	1500	20191216.TM-G.A59F2s
o-Terphenyl (Surr.)	N/A	% Rec	60	91.2	140	20191216.TM-G.A59F2s

Positive Control: LFSM (21)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F2 (C10-C16)	N/A	% Rec	60	127	140	20191216.TM-G.A59F2s
F3 (C16-C34)	N/A	% Rec	60	65.7	140	20191216.TM-G.A59F2s

Sample Spike: Matrix Spike (9)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
F1 (C6-C10) Incl. BTEX	N/A	% Rec	60	100.2	140	20191216.TM-G.A127s

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Volatile Organic Compounds

Positive Control: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
1,1,1,2-Tetrachloroethane	N/A	% Rec	60	88.6	130	20191219.TM-G.A14VOCs
1,1,1-Trichloroethane	N/A	% Rec	60	126	130	20191219.TM-G.A14VOCs
1,1,2,2-Tetrachloroethane	N/A	% Rec	60	65.7	130	20191219.TM-G.A14VOCs
1,1,2-Trichloroethane	N/A	% Rec	60	89.9	130	20191219.TM-G.A14VOCs
1,1-Dichloroethane	N/A	% Rec	60	126	130	20191219.TM-G.A14VOCs
1,1-Dichloroethylene	N/A	% Rec	60	94.7	130	20191219.TM-G.A14VOCs
1,2-Dibromoethane	N/A	% Rec	60	92.8	130	20191219.TM-G.A14VOCs
1,2-Dichlorobenzene	N/A	% Rec	60	71.7	130	20191219.TM-G.A14VOCs
1,2-Dichloroethane	N/A	% Rec	60	66.3	130	20191219.TM-G.A14VOCs
1,2-Dichloroethane-d4 (Surr)	N/A	% Rec	50	78.1	140	20191219.TM-G.A14VOCs
1,2-Dichloropropane	N/A	% Rec	60	84.1	130	20191219.TM-G.A14VOCs
1,3-Dichlorobenzene	N/A	% Rec	60	76.4	130	20191219.TM-G.A14VOCs
1,4-Dichlorobenzene	N/A	% Rec	60	82.1	130	20191219.TM-G.A14VOCs
1-Bromo-4-fluorobenzene (Surr.)	N/A	% Rec	50	93.5	140	20191219.TM-G.A14VOCs
Acetone	N/A	% Rec	60	90.2	130	20191219.TM-G.A14VOCs
Benzene	N/A	% Rec	60	119	130	20191219.TM-G.A14VOCs
Bromoform	N/A	% Rec	60	80.3	130	20191219.TM-G.A14VOCs
Bromomethane	N/A	% Rec	60	92.3	130	20191219.TM-G.A14VOCs
Carbon tetrachloride	N/A	% Rec	60	126	130	20191219.TM-G.A14VOCs
Chlorobenzene	N/A	% Rec	60	98.3	130	20191219.TM-G.A14VOCs
Chloroform	N/A	% Rec	60	127	130	20191219.TM-G.A14VOCs
cis-1,2-Dichloroethylene	N/A	% Rec	60	125	130	20191219.TM-G.A14VOCs
cis-1,3-Dichloropropene	N/A	% Rec	60	70.2	130	20191219.TM-G.A14VOCs
Dibromochloromethane	N/A	% Rec	60	84.8	130	20191219.TM-G.A14VOCs
Dichlorodifluoromethane	N/A	% Rec	60	119	130	20191219.TM-G.A14VOCs
Dichloromethane	N/A	% Rec	60	95.4	130	20191219.TM-G.A14VOCs
Ethylbenzene	N/A	% Rec	60	90.2	130	20191219.TM-G.A14VOCs

m+p-Xylene	N/A	% Rec	60	90.3	130	20191219.TM-G.A14VOCs
Methyl ethyl ketone	N/A	% Rec	60	109	130	20191219.TM-G.A14VOCs
Methyl isobutyl ketone (MIBK)	N/A	% Rec	60	74.4	130	20191219.TM-G.A14VOCs
Methyl tert-butyl ether (MTBE)	N/A	% Rec	60	106	130	20191219.TM-G.A14VOCs
o-Xylene	N/A	% Rec	60	91.3	130	20191219.TM-G.A14VOCs
Styrene	N/A	% Rec	60	96.2	130	20191219.TM-G.A14VOCs
Tetrachloroethylene	N/A	% Rec	60	95.9	130	20191219.TM-G.A14VOCs
Toluene	N/A	% Rec	60	87.1	130	20191219.TM-G.A14VOCs
Toluene-d8 (Surr.)	N/A	% Rec	50	96.4	140	20191219.TM-G.A14VOCs
Trans-1,2-dichloroethylene	N/A	% Rec	60	108	130	20191219.TM-G.A14VOCs
Trans-1,3-dichloropropene	N/A	% Rec	60	65.9	130	20191219.TM-G.A14VOCs
Trichloroethylene	N/A	% Rec	60	101	130	20191219.TM-G.A14VOCs
Trichlorofluoromethane	N/A	% Rec	60	82.1	130	20191219.TM-G.A14VOCs
Vinyl chloride	N/A	% Rec	60	97.7	130	20191219.TM-G.A14VOCs

Positive Control: LFSM (21)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
1,1,1,2-Tetrachloroethane	N/A	% Rec	60	90.6	130	20191219.TM-G.A14VOCs
1,1,1-Trichloroethane	N/A	% Rec	60	111	130	20191219.TM-G.A14VOCs
1,1,2,2-Tetrachloroethane	N/A	% Rec	60	65.3	130	20191219.TM-G.A14VOCs
1,1,2-Trichloroethane	N/A	% Rec	60	93.4	130	20191219.TM-G.A14VOCs
1,1-Dichloroethane	N/A	% Rec	60	126	130	20191219.TM-G.A14VOCs
1,1-Dichloroethylene	N/A	% Rec	60	95.5	130	20191219.TM-G.A14VOCs
1,2-Dibromoethane	N/A	% Rec	60	96	130	20191219.TM-G.A14VOCs
1,2-Dichlorobenzene	N/A	% Rec	60	67.3	130	20191219.TM-G.A14VOCs
1,2-Dichloroethane	N/A	% Rec	60	105	130	20191219.TM-G.A14VOCs
1,2-Dichloroethane-d4 (Surr)	N/A	% Rec	50	70.3	140	20191219.TM-G.A14VOCs
1,2-Dichloropropane	N/A	% Rec	60	83.4	130	20191219.TM-G.A14VOCs
1,3-Dichlorobenzene	N/A	% Rec	60	71.5	130	20191219.TM-G.A14VOCs
1,4-Dichlorobenzene	N/A	% Rec	60	76	130	20191219.TM-G.A14VOCs
1-Bromo-4-fluorobenzene (Surr.)	N/A	% Rec	50	85.9	140	20191219.TM-G.A14VOCs

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Acetone	N/A	% Rec	60	97.7	130	20191219.TM-G.A14VOCs
Benzene	N/A	% Rec	60	108	130	20191219.TM-G.A14VOCs
Bromoform	N/A	% Rec	60	81.5	130	20191219.TM-G.A14VOCs
Bromomethane	N/A	% Rec	60	62.5	130	20191219.TM-G.A14VOCs
Carbon tetrachloride	N/A	% Rec	60	107	130	20191219.TM-G.A14VOCs
Chlorobenzene	N/A	% Rec	60	97.8	130	20191219.TM-G.A14VOCs
Chloroform	N/A	% Rec	60	123	130	20191219.TM-G.A14VOCs
cis-1,2-Dichloroethylene	N/A	% Rec	60	109	130	20191219.TM-G.A14VOCs
cis-1,3-Dichloropropene	N/A	% Rec	60	65.8	130	20191219.TM-G.A14VOCs
Dibromochloromethane	N/A	% Rec	60	85.3	130	20191219.TM-G.A14VOCs
Dichlorodifluoromethane	N/A	% Rec	60	124	130	20191219.TM-G.A14VOCs
Dichloromethane	N/A	% Rec	60	102	130	20191219.TM-G.A14VOCs
Ethylbenzene	N/A	% Rec	60	88.7	130	20191219.TM-G.A14VOCs
m+p-Xylene	N/A	% Rec	60	85.1	130	20191219.TM-G.A14VOCs
Methyl ethyl ketone	N/A	% Rec	60	97.7	130	20191219.TM-G.A14VOCs
Methyl isobutyl ketone (MIBK)	N/A	% Rec	60	75.3	130	20191219.TM-G.A14VOCs
Methyl tert-butyl ether (MTBE)	N/A	% Rec	60	107	130	20191219.TM-G.A14VOCs
o-Xylene	N/A	% Rec	60	88.6	130	20191219.TM-G.A14VOCs
Styrene	N/A	% Rec	60	85.5	130	20191219.TM-G.A14VOCs
Tetrachloroethylene	N/A	% Rec	60	95	130	20191219.TM-G.A14VOCs
Toluene	N/A	% Rec	60	87.7	130	20191219.TM-G.A14VOCs
Toluene-d8 (Surr.)	N/A	% Rec	50	94	140	20191219.TM-G.A14VOCs
Trans-1,2-dichloroethylene	N/A	% Rec	60	116	130	20191219.TM-G.A14VOCs
Trans-1,3-dichloropropene	N/A	% Rec	60	66	130	20191219.TM-G.A14VOCs
Trichloroethylene	N/A	% Rec	60	98.7	130	20191219.TM-G.A14VOCs
Trichlorofluoromethane	N/A	% Rec	60	93.6	130	20191219.TM-G.A14VOCs
Vinyl chloride	N/A	% Rec	60	95.8	130	20191219.TM-G.A14VOCs

THIS INDEX SHOWS HOW YOUR SAMPLES ARE ASSOCIATED TO THE CONTROLS INCLUDED IN THE IDENTIFIED BATCHES.

Sample Description	Lab ID	Method	QAQCID	Prep QAQCID
BH1 AS1	1504218	BTEX/F1 Soil (A127)	20191216.TM-G.A127s	
BH1 AS1	1504218	Moisture (A99)	20191213.TM-G.A99moist	

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

BH1 AS1	1504218	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH1 AS1	1504218	pH Soil (R2)	20191219.TM-G.R2B
BH1 AS1	1504218	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH1 AS1	1504218	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH1 AS1	1504218	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH1 AS1	1504218r	pH Soil (R2)	20191219.TM-G.R2B
BH1 AS1	1504218r	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH3 AS1	1504219	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH3 AS1	1504219	Moisture (A99)	20191213.TM-G.A99moist
BH3 AS1	1504219	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH3 AS1	1504219	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH3 AS1	1504219	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH3 AS1	1504219	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH6 AS1	1504220	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH6 AS1	1504220	Moisture (A99)	20191213.TM-G.A99moist
BH6 AS1	1504220	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH6 AS1	1504220	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH6 AS1	1504220	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH6 AS1	1504220	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH8 SS5	1504221	Anions Soil (A5)	20191217.A5G
BH8 SS5	1504221	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH8 SS5	1504221	Cond Soil (R12)	20191219.TM-G.R12B
BH8 SS5	1504221	Moisture (A99)	20191213.TM-G.A99moist
BH8 SS5	1504221	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH8 SS5	1504221	pH Soil (R2)	20191219.TM-G.R2B
BH8 SS5	1504221	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH8 SS5	1504221	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH8 SS5	1504221	RedOx - Soil (T06)	20191219.TM-M.A6B
BH8 SS5	1504221	Resistivity Soil (R12)	20191219.TM-G.R12C
BH8 SS5	1504221	Sulphide/S (R98)	20191219.R98B
BH8 SS5	1504221	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs

CERTIFICATE OF ANALYSIS - REVISED

Supersedes report printed: 12/19/2019 13:51

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

BH8 SS5	1504221r	Anions Soil (A5)	20191217.A5G
BH8 SS5	1504221r	Cond Soil (R12)	20191219.TM-G.R12B
BH8 SS5	1504221r	RedOx - Soil (T06)	20191219.TM-M.A6B
BH8 SS5	1504221r	Sulphide/S (R98)	20191219.R98B

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

BrookMcIlroy/

Form 2.3

Addendum No. 1

Project **No.: 19-076**

Date: **March 7, 2022**

Project: **Sault Ste. Marie – Downtown Civic Plaza**

The following information supplements and/or supersedes the bid documents issued on **February 25, 2022**.

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number and date on the Tender Form. Failure to do so may subject bidder to disqualification.

See enclosed for additional information to clarify the tender documents previously issued.

1. Architectural Drawings:
    a. A003 – DOOR, FRAME AND GLAZING SCHEDULE
        1. Updated the door and frame schedule – renumbered door D-108 as below.
        2. Added hardware groups to schedule.
    b. A201 GROUND FLOOR PLAN:
        1. Renumbered Door D-108G to D-107B to align with door hardware schedule
2. Architectural Specification:
    a. Section 08 71 00 – Finish Hardware:
        1. Added Section 08 71 00 – Finish Hardware
3. Mechanical Addendum No. 1

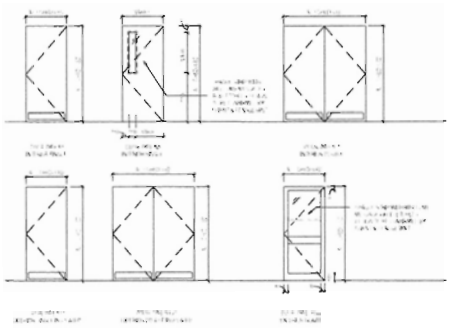
END OF ADDENDUM

DOOR AND FRAME SCHEDULE

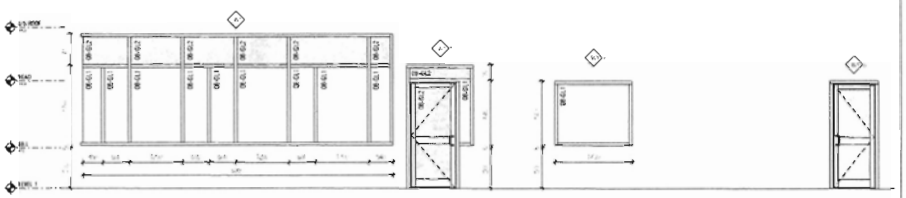
Door No.	From Room: Name	To Room: Name	Door Width	Door Height	Door Matl	Door Type	Door Finish	Door Glazing	Frame Type	Frame Matl	Frame Finish	Frame Glazing	Fire Rating	Group	Comments
100A	1 Lobby	2 Vestibule	W1	2925	1.5	1	P	N/A	HMF	1.5	P	N/A	1 HR	01	
100B	2 Vestibule	3 Lobby	W1	2925	1.5	1	P	N/A	HMF	1.5	P	N/A	1 HR	02	
101	3 Lobby	4 Service Hall	W2	2925	1.5	2	P	N/A	HMF	1.5	P	N/A	1 HR	03	
102	4 Service Hall	5 Mechanical	W3	2925	1.5	3	P	N/A	HMF	1.5	P	N/A	1 HR	04	
103	4 Service Hall	6 Electrical	W3	2925	1.5	3	P	N/A	HMF	1.5	P	N/A	1 HR	05	
104	4 Service Hall	7 Janitor	W4	2925	1.5	4	P	N/A	HMF	1.5	P	N/A	1 HR	06	
105	4 Service Hall	8 Storage	W5	2925	1.5	5	P	N/A	HMF	1.5	P	N/A	1 HR	07	
106	4 Service Hall	9 Server Room	W6	2925	1.5	6	P	N/A	HMF	1.5	P	N/A	1 HR	08	
107	4 Service Hall	10 Fire Pump Room	W7	2925	1.5	7	P	N/A	HMF	1.5	P	N/A	1 HR	09	
108	4 Service Hall	11 Generator Room	W8	2925	1.5	8	P	N/A	HMF	1.5	P	N/A	1 HR	10	
109	4 Service Hall	12 Loading Dock	W9	2925	1.5	9	P	N/A	HMF	1.5	P	N/A	1 HR	11	
110	12 Loading Dock	13 Waste Storage	W10	2925	1.5	10	P	N/A	HMF	1.5	P	N/A	1 HR	12	
111	13 Waste Storage	14 Exterior	W11	2925	1.5	11	P	N/A	HMF	1.5	P	N/A	1 HR	13	
112	1 Lobby	15 Office 1	W12	2925	1.5	12	P	N/A	HMF	1.5	P	N/A	1 HR	14	
113	1 Lobby	16 Office 2	W13	2925	1.5	13	P	N/A	HMF	1.5	P	N/A	1 HR	15	
114	1 Lobby	17 Office 3	W14	2925	1.5	14	P	N/A	HMF	1.5	P	N/A	1 HR	16	
115	1 Lobby	18 Office 4	W15	2925	1.5	15	P	N/A	HMF	1.5	P	N/A	1 HR	17	
116	1 Lobby	19 Office 5	W16	2925	1.5	16	P	N/A	HMF	1.5	P	N/A	1 HR	18	

GLAZING SCHEDULE

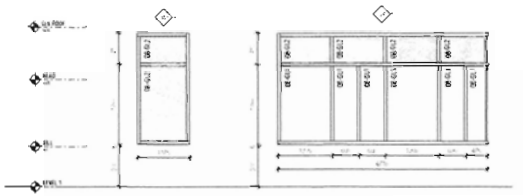
#	Location	Size: Height	Size: Width	Elevation	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					



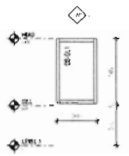
DOOR TYPE LEGEND
1 : 50



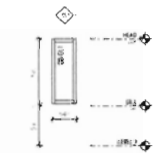
2 NORTH GLAZING
1 : 50



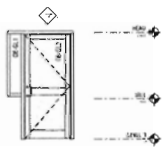
3 EAST GLAZING
1 : 50



4 GLAZING - OFFICE 1
1 : 10



5 GLAZING - OFFICE 2
1 : 10



6 INTERIOR VESTIBULE DOOR
1 : 10

NOTES:

GR-GL1 GLASS TYPE 1 - LOW-E 30mm INSULATED GLASS UNIT

GR-GL2 GLASS TYPE 2 - 25mm BRONZE TED GLASS UNIT WITH FROSTED FILM ON SURFACE 2

No.	Date	Issued For
6	2022-03-07	Addendum 1
5	2022-02-25	Tender / Permit
4	2022-02-07	Consultant Coordination
3	2021-10-04	Issued for Cost Estimate
2	2021-09-13	Issued for Consultant Coordination
1	2021-06-10	Issued for Consultant Coordination

ONTARIO ASSOCIATION OF ARCHITECTS
CALVIN BROOK
LICENCE
10410

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Wavert Shield South, Sault Ste. Marie, ON, P6A 2A3

BrookMcIlroy

SHEET TITLE

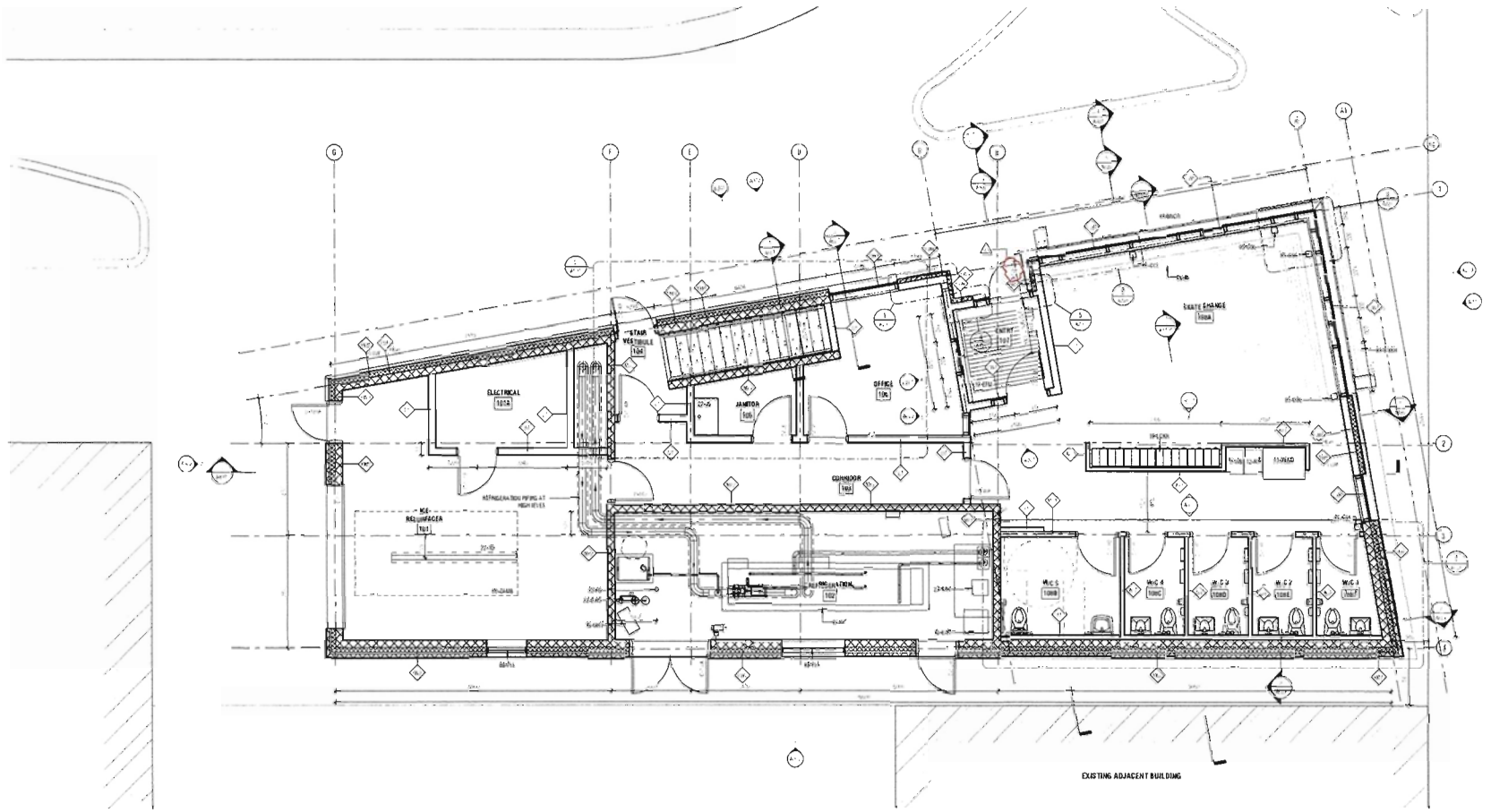
DOOR, FRAME AND GLAZING SCHEDULE

PROJECT NO: 19-076

DATE: 2021-06-10

SHEET NO.

A003



1 GROUND FLOOR PLAN

NOTES:

No.	Date	Issued For
8	2022-03-07	Addendum 1
7	2021-02-25	Tender / Permit
6	2020-12-07	Consultant Coordination
5	2021-10-04	Issued for Cost Estimate
4	2021-09-10	Issued for Continued Coordination
3	2021-06-10	Issued for Continued Coordination

SSM DOWNTOWN CIVIC PLAZA - SERVICE BUILDING

Queen Street South, Suite 902, Mono, ON, L9W 3K9

BrookMcIlroy

GROUND FLOOR PLAN

19-076

2021-06-10

A201

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Furnish, deliver, and install finish hardware.

.2 It is intended that the following list of hardware will cover finish hardware to complete the project. Bring to the Consultants attention any omissions, discrepancies that will affect work in this section during the bidding period.

1.2 1.2 Related Sections

.1 General Requirements Division 1

.2 06 20 00 Finish Carpentry

.3 06 40 00 Architectural Woodwork

.4 08 10 00 Doors and Frames

.5 08 40 00 Entrances, Storefronts and Curtain Walls

.6 Division 26 Electrical

.7 Division 28 Electronic Safety and Security

1.3 Products Supplied but not Installed in this Section

.1 Power supplies, compressor/control boxes, junction boxes installed by Division 26.

1.4 References

.1 Door and Hardware Institute - Recommended locations for Architectural Hardware for Standard Steel Doors and Frames

.2 Door and Hardware Institute - Recommended locations for Architectural Hardware for Flush Wood Doors

.3 CSDMA-Recommended Dimension Standards for Commercial Steel Doors and Frames (Hardware Locations)

.4 NFPA 80-Standard for Fire Doors and Windows, 1999 Edition

.5 Door and Hardware Institute - Sequence Format for Hardware Schedule

.6 Door and Hardware Institute - Key Systems and Nomenclature

.7 Door and Hardware Institute - Abbreviations and Symbols used in Architectural Door and Hardware Schedules and Specifications

.8 Door and Hardware Institute – Installation Guide for Doors and Hardware

.9 Ontario Building Code 2012

1.5 SUBMITTALS

.1 Updated Finish Hardware Schedule:

.1 Submit submittals in accordance with Section 01 30 00 Submittal Procedures. Prepare detailed hardware schedules in Door and Hardware (DHI) vertical format as detailed in Reference 1.4.4.

.2 LEED submittals:

.1 Submit LEED submittals in accordance with Section 01 35 00 Special Procedures.

.2 Submit documentation to verify compliance with LEED objectives and requirements.

.3 Product Data:

.1 Submit in a three-ring binder six (6) copies of product data sheets with the finish hardware schedule showing items of hardware to be used on the project.

.4 Samples:

.1 When requested in writing, provide (to the Consultants Site Office) one sample of each hardware item complete with fasteners, within thirty (30) calendar days of award of a purchase order. Samples to be clearly labeled with their hardware schedule designation and manufacturers' name and model number. Samples will be incorporated into the work.

.5 Templates:

.1 Submit templates within to related trades when requested.

.6 Keying Schedule:

.1 After a keying meeting between representatives of the Owner, furnish a keying schedule listing the levels of keying as well as an explanation of the key system's function, the key symbols used, and the door numbers controlled. Utilize "Door and Hardware Institute - Key Systems and Nomenclature" as a guideline for nomenclature, definitions, and approach for selecting the optimal keying system. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

.7 Wiring Diagrams

.1 Co-ordinate with related trades, meet with the owner and security provider and submit a written description of the functional use (mode of operation) of electrical hardware products specified. Include operation for ingress, egress, fire alarm, and after hours use where applicable. Include door and frame elevations showing the location of each item of electrical hardware to be installed, mode of operation including a diagram showing number and size of conductors. Indicate on elevation drawing items provided by related trades, include for back boxes, and 120V power sources. Provide point to point drawings showing terminal connections necessary for a complete installation.

.8 Operations and Maintenance Data

.1 Prior to Substantial Completion, furnish to the owner, two (2) copies of an owner's operation and maintenance manuals in a three-ring binder with the following information:

.1 Name of hardware distributor, address and contact name

Copy of final "as-built" finish hardware schedule

.2 As installed "wiring diagrams, elevations, risers, point to point"

.3 Copy of final keying schedule

.4 Copy of floor plans with keying nomenclature assigned to door numbers as per the approved keying schedule

.5 Catalogue cut sheets and product specifications for each product

.6 Parts list for each product

.7 Installation instructions and templates for each product

1.6 QUALITY ASSURANCE

.1 Review installation procedures with the Contractor's Designated Installers. Hold instruction meetings with installers prior to installation and subsequent review meetings during the installation period. Submit minutes of meetings to the Consultant.

.2 Substitutions

Only approved products specified are accepted. Make substitution requests in accordance with Division 1. Include product data and indicate benefit to the project.

.3 Supplier Qualifications

.1 Successful hardware distributor to have a minimum of five (5) years' experience in the door and hardware industry. Distributor to have on staff an Architectural Hardware Consultant (A.H.C.) whose name will be listed on the hardware schedule title page submittal and will be responsible for scheduling,

detailing, (see Reference 1.5.4) ordering and co-ordination of the finishing hardware for this project. If so, requested by the Consultant and or installer this individual will be required to visit the jobsite for any installation problems that may occur.

.4 Designated Installers

.1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval. Installers to attend review meetings with the Hardware Distributor.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Marking and Packaging

.1 Mark cartons with heading number, door number, and key-set symbol where applicable in original packaging provided by the manufacturer. Pack packaged hardware in suitable wrappings and containers to protect it from damage during shipping and storage.

.2 Enclose accessories, fastening devices and other loose items with each applicable item of hardware.

.2 Delivery

.1 Deliver hardware to related trades.

.3 Storage

.1 Store in a clean, dry room with lockable man door and adequate shelving to permit organization so item numbers are readily visible.

1.8 WARRANTY

.1 Furnish warranties by the accepted manufacturers:

Hardware Item	**Length of Warranty**
Mortise Hinges	1year
Locks (ND)	1 years
Exit Devices	3 years
Door Closers - Mechanical 1461 series	30 years
Door Closers – 4040XP	30 years
Door Operators - Electro Mechanical	2 years
Electric Hold Open Devices - Electro mechanical	2 years
Overhead Stops/Holders	1 year
Floor/Wall stops	1 year
Electric Strikes	5 years
Key Switches/Power Supplies	1 year

1.9 MAINTENANCE

.1 Maintenance Service

.1 After the building is occupied arrange an appointment with the maintenance staff from the University of Waterloo Indigenization Suite for instruction of proper use, servicing, adjusting and lubrication of hardware furnished. Submit to the consultant a list of attendees and meeting date.

.2 Extra Materials

.1 Furnish the following items in proper manufacturer's cartons once the job has been completed:

.1 5 of each installation tool used for locks/passage/privacy, type of door closers, and exit devices.

PART 2 - PRODUCTS

2.1 Manufacturers

.1 Products listed in the hardware groups are from the manufacturers below:

ITEM	MANUFACTURER NAME
Full Mortise Hinges	Ives
Continuous Hinges	Ives
Locksets, Latchsets/Deadbolts	Schlage
Cylinders	Schlage
Exit Devices	Von Duprin
Surface/Flush Bolts	Ives
Door Closers	LCN
Overhead Door Holders/Stops	Glynn Johnson
Door Pulls/Flatware	Ives
Wall/Floor Stops	Ives
Weather/Smoke/Sound Seals	Zero
Door Sweeps/Thresholds	Zero
Automatic Door Operators/Actuators	LCN
Keyswitch/Magnetic Locks	Schlage Electronics
Electric Strikes	Von Duprin
Power Supplies	Schlage Electronics, Von Duprin

2.2 Materials

.1 Screws and Fasteners:

.1 Screws and fasteners to be matching finish to their product and to be manufacturer's standard. Door closers, door holders and exit devices installed on fire rated wood doors and hollow metal doors to be attached with fasteners to meet NFPA 80 requirements.

.2 Materials-Acceptable Manufacturers (Note: Supply products in a given category from the same manufacturer):

.1 Mortise Hinges

.1 Provide five knuckle bearing hinges with NRP option on reverse bevel doors with locking hardware. Hinge width to accommodate door closer projection, door trim and allow for 180-degree swing. Doors up to 2286mm (90") in height, supply 3 hinges, doors greater than 2286mm in height add one hinge for every additional 760mm of door height. Doors 915mm (36") wide and less furnish 114mm (4-1/2") high hinges, doors greater than 915mm (36") wide furnish 127mm (5") high hinges, heavy weight or standard weight as specified. Supply ferrous (steel), stainless steel material for all interior and/or fire-rated doors and stainless steel for exterior doors.

.1 As Specified: Ives 5BB1

.2 Continuous Hinges:

.1 Ives 112XY series edge mount/edge guard continuous barrel-type steel hinges. Hinges certified to ANSI 156.26, Grade 2, tested and approved to UL 10C (3 hr.). Barrel type hinge with twin self lubricated nylon bearings with stainless steel pin. Hinge length 25mm (1") less door height.

.1 Supply as Specified: Ives 112HD series

.3 Locksets/Deadlocks/Privacy Sets:

.1 Cylindrical:

.1 Extra heavy duty residential, commercial, institutional and industrial applications. Latch bolts to be steel with minimum 13mm (½") throw deadlocking on keyed functions. 19mm (¾") throw anti-friction latchbolt on pairs of fire doors. Provide manufacturer's standard wrought box strike for each latch or lock, with curved lip extended to protect frame. Locks and latchsets tested to exceed 8,000,000 cycles. Provide molex connections for electrified functions as a standard. Lock case to be steel, incorporate one-piece spring cage and spindle. Precision solid brass 6-pin cylinder with nickel silver keys available in Schlage keyways. Levers to be solid with no plastic inserts.

1. Supply as Specified: ND Locksets

.4 Exit Devices/Device Trims/Mullions:

.1 Narrow Style:

.1 Exit device to be cUL listed for panic hardware and fire exit hardware. Supply exit devices and fire exit devices featuring coil compression springs on device mechanism subassemblies and dead latching mechanisms for active latch bolts. Supply exit devices with smooth mechanism case and "the quiet one" fluid dampener to eliminate noise associated with exit device operations. Non-handed device with touchpad assemblies with no

exposed fasteners and cast end caps, reinforced aluminum with stainless steel touchpad and raised edge to minimize pinching. Doors greater than 950mm wide supply long bar exit devices, doors greater than 2134mm (84") high supply extension rods were required. Fits door stiles as narrow as 45mm (1 ¾").

1. Supply as Specified: Von Duprin 35A series

.5 Door Closers:

.1 Door closers to have the following features (see separate closer sections below for further information):

.1 Fully hydraulic, rack and pinion action with high strength cast iron cylinders and one-piece forged steel pistons.

.2 Include high efficiency, low friction pinion bearings.

.3 Hydraulic fluid of a type requires no seasonal adjustments, ULTRA X TM fluid has constant temperature control from -35 degrees Celsius to +49 degrees Celsius.

.4 Hydraulic regulation controlled by tamper-proof, non-critical screw valves, adjustable with a hex wrench.

.5 Separate adjustments for backcheck, general speed and latch speed.

.6 Door closers with special template (ST-) numbers include required associated product, information sheets and instructions

.7 Size 1 manual door closers to provide less than 5 pounds opening force on a 900mm door leaf.

.8 Door closer with Pressure Relief Valves are not accepted.

.9 Door closer bodies, arms, covers to be powder coated

.10 Closers with powder coat finishes to exceed a minimum 100-hour salt spray test, as described in ANSI A156.18 and ASTM B117.

.11 Closers detailed with plated finishes to include plated covers (or finish plates), arms and visible fasteners.

.2 Medium Duty Mechanical (Interior/Exterior):

.1 Non-sized (1-6) and non-handed cylinder body to have 32mm (1 ¼") piston diameter with 16mm (5/8") single heat-treated shaft. Track closer cylinder body non-sized (2-4) or (1-2). Closers to have stamped main arm and forearm (forged steel main arm and forearm EDA and CUSH type arms). Optional arms to be interchangeable within the series of closers, except track arm type

closers. Track arm type closers to have single lever arm with low friction track and roller assembly and provisions for an optional bumper to assist backcheck.

1. Supply as Specified: LCN1460 HD series

.3 Heavy Duty Mechanical (Multiple Applications):

.1 Non-sized (1-6) and non-handed cast iron cylinder body to have 38mm (1 1/2") diameter with 19mm (3/4") journal double heat-treated pinion shaft with 16mm (5/8") full complement bearings. XP closer hydraulic regulation controlled by tamper-proof, non-critical screw valves, abrasion resistant Vitron "O" ring, adjustable with a hex wrench. Closer to have "FAST" Power Adjust speed dial to show spring size power. Track closers non-sized 1-4. Closers to have forged steel main arm and forearm (forged steel main arm and forearm EDA and CUSH type arms). Optional arms to be interchangeable within the series of closers, except track arm type closers. Track arm type closers to have single lever forged arm with low friction track and roller assembly and provisions for an optional bumper to assist backcheck.

1. Supply as Specified: LCN 4040XP series

.2 "NOTE: LOW ENERGY OPERATORS SUPPLIED AND INSTALLED BY THIS SECTION"

.4 Heavy Duty Electric Operator

.1 Provide low energy automatic operator units that are electro-mechanical design. Powered by DC motor working through reduction gears. Spring force closing. Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 2 to 30 seconds, and logic terminal to interface with accessories, mats, and sensors. Provide full length aluminum header, drop plates, angle brackets, or adapters for arms to suit details. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings, consult with owner.

.6 Supply as Specified: LCN 9542, series c/w keyswitch or rocker 8310-806K/RActuators:

.1 Wall Type

.1 Wall plate switch to be hard-wired actuator with round, stainless steel touch plate in either 114mm (4-1/2") or 152mm (6") diameters. Engraved blue filled handicap symbol conforms to most accessibility codes. Units to include heavy grade components for vandal resistant mounting and weather resistant switch standard.

1. Supply as specified: LCN 8310-852

.7 Overhead Door Stops/Holders:

.1 Heavy Duty Concealed Mounting:

.1 Concealed overhead stops/holders to be stainless steel base, non-handed for single or double-acting doors with a low-profile channel, mortised in the door and jamb bracket is mortised in the doorframe. Unit to be fully concealed when door is in the closed position. Units to be field adjustable for function changes if required.

1. Supply as Specified: Glynn-Johnson 100 series

.8 Door Pulls/Flatware/Coat Hooks:

.1 Supply as Specified: 8145EZHD (Door Pull) mounting as indicated in the hardware sets.

.1 Ives 8200 B-NH-A tape mounting for installation, sizes as specified in hardware groups

.2 Ives 8400 B-NH-A, tape mounting for installation (Kickplates 40mm (1-5/8") less door width single door and 25mm (1") less door width double doors)

.9 Floor/Wall Stops:

.1 Wall Stops (No Button on Locking Hardware):

.1 Wall stops to be constructed of stainless-steel base with special retainer cup that makes the rubber stop tamper resistant. Convex design of rubber bumper.

1. Supply as Specified: Ives WS406/407CVX

.2 Wall Stops (Projecting Button on Locking Hardware):

.1 Wall stops to be constructed of stainless-steel base with special retainer cup that makes the rubber stop tamper resistant. Concave rubber bumper to avoid damage to locks with projecting buttons.

1. Supply as Specified: Ives WS406/407CCV

.10 Weather/Smoke/Sound Seals:

.1 Supply as Specified: Zero 188SBK

.11 Thresholds/Weatherstrip/Door Sweeps:

.1 Supply as Specified: Zero 8192AA (Door Sweep)

.12 Keyswitch/Electric Strikes/Magnetic Locks/Power Supplies, Power Transfers, Mortar Guards:

.13 Power Supplies:

.1 Power supplies to be tested and certified to meet UL294. Universal 120-240 VAC input, low voltage DC output, regulated and filtered. Power supplies to have 2A, 4A, 6A output,12/24VDC field selectable with jumper. Provide emergency release terminals, where required, that allow the release of devices upon activation of the fire alarm system complete with fire alarm input for initiating "no delay" exiting mode. Power supply to be flat mounting design and polarized locking connections for additional option boards specified.

.2 Supply as Specified: Schlage Electronics PS-902, PS-904, PS-906

.3 Electro-Magnetic Door Holders:

.1 Provide floor and wall mounted units to hold door in open position and to release and automatically close under fire alarm conditions. Electromagnet shall be protected against transients and voltage surges up to 600 volts. Power requirements, tri-voltage field selectable, 12, 24VDC, 120VAC.

1. Supply as Specified: LCN-SEM 7800 series

2.3 Finishes

.1 Unless otherwise specified, finishes to be brushed chrome (BHMA 626/652).

.2 Finishes are specified as follows:

ITEM	BHMA#	DESCRIPTION	BASE MATERIAL
Hinges	630	satin stainless steel	stainless steel
Hinges	652	satin chrome plated	steel
Continuous Hinges	689	anodized aluminum	aluminum
Lock Trim	626	satin chrome plated	brass/bronze
Exit Devices	626	satin chrome plated	brass/bronze
Door Closer	689	powder coat aluminum	steel
Door Pulls	630	satin stainless steel	stainless steel
Protective Plate	630	satin stainless steel	stainless steel
Protective Plate	629	polished stainless steel	stainless steel
Door Stops/Holders			
Overhead	630	satin stainless steel	stainless steel
Wall/Floor	626	satin chrome plated	brass/bronze
Thresholds	628	anodized aluminum	aluminum
Weatherstrip	628	anodized aluminum	aluminum

2.4 Cylinders, Keying Systems and Key Control

.1 Meet with the Owner to finalize keying requirements and obtain keying instructions in writing as outlined in Division 1. Locks cylinders shall be furnished with a new Schlage master key system.

.2 Provide temporary construction keying during construction period. Permanent keys will be furnished to the owners representative prior to occupancy.

PART 3 - EXECUTION

3.1 Examination

.1 Ensure that doors and frames are prepared and reinforced to receive finish hardware prior to installation.

.2 Ensure that door frames and finished floor are plumb and level to permit proper engagement and operation of hardware.

.3 Verify power is run to door opening requiring electrified hardware.

.4 Submit in writing a list of deficiencies determined as part of inspection required in 3.1.1 and 3.1.2 to supervising consultant prior to installation of finished hardware. Correct door frame installation before proceeding with finish hardware installation.

3.2 Installation

.1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval. Installers to attend review meetings conducted by the hardware distributor.

.2 Install hardware at mounting heights as specified in the manufacturer's templates or specific references in approved hardware schedule or approved elevation drawings.

.3 Where mounting height is not otherwise specified, install hardware at mounting heights as indicated in 1.4.1, 1.4.2.

.4 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.

.5 Ensure locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. *Handing is part of installation procedure.*

.6 Ensure that exit devices are of the correct hand and adjust device cam/drive screw for proper outside trim function prior to installation. Handing is part of installation procedure.

.7 Follow manufactures installation instructions. Adjustment of door closers is inclusive of spring power, closing speed, latching speed and back-check, valve screws to achieve backcheck (4040, 4040XP series) at the time of installation.

.8 Adjust delayed action door closers to forty (40) second delay for barrier free accessibility and movement of materials. Time period to be approved by Owner.

.9 Install head seal weatherstrip prior to installation of soffit mounted hardware. Trim cut and notch thresholds and saddles neatly to minimally fit the profile of the door frame. Install thresholds and saddles in a bed of caulking completely sealing the underside from water and air penetration.

.10 Counter sink through bolt of door pull under push plate during installation.

.11 Install blocking material in cavities of metal and wood stud walls and partitions. Located concave and convex type door bumpers at the appropriate height to properly contact protruding door trim.

3.3 Field Quality Control

.1 Verify each door leaf opens closes and latches. Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements. Test access control system and electrified hardware devices for proper operation with owner to sign off on verification of operation. Verify electric door release hardware operates to close the door upon activation of the fire alarm system.

.2 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.

.3 Before completion of the work but after the hardware has been installed, submit a certificate to the Consultant stating that final inspection has been made and that hardware has been checked for installation and operation.

3.4 Adjusting And Cleaning

.1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.

.2 Adjust doors with self-closing devices or automatic closing devices for operation after the HVAC system is balanced and adjusted. Adjust spring power of non sized door closers to close and latch the door.

.3 Hardware to be left clean and free of disfigurements.

.4 Instruct owner personnel in the operation, adjustment and maintenance of hardware.

.5 Check locked doors against approved keying schedule.

3.5 Protection

.1 Protect hardware from damage during construction. Wrap locks, panic hardware, and fire exit hardware, door pull trim with kraft paper or plastic bubble materials to protect finish from damage until date of substantial completion. Remove and reinstall or where necessary, use temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.6 Hardware Groups

Finish Hardware

Hardware Group No. 01

For use on Door #(s):
D-001

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 REG	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Hardware Group No. 02

For use on Door #(s):
D-004

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 EDA	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Hardware Group No. 03

For use on Door #(s):
D-101

Provide each RU door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ALL HARDWARE	BY ROLL-UP DOOR SUPPLIER		

Finish Hardware

Hardware Group No. 04

For use on Door #(s):
D-101A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	LOCK GUARD	LG13	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1595 ST-3068	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
2	EA	JAMB SEAL	328AA [2 @ JAMBS]	AA	ZER
1	EA	HEAD SEAL	429AA [1 @ HEAD]	AA	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	8655A	A	ZER
1	EA	DOOR CONTACT	679-05 (TO SUIT DR MTL)	BLK	SCE

Hardware Group No. 05

For use on Door #(s):
D-101B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 CUSH	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Finish Hardware

Hardware Group No. 06

For use on Door #(s):
D-102B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	LOCK GUARD	LG13	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH ST-1595 ST-3068	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
2	EA	JAMB SEAL	328AA [2 @ JAMBS]	AA	ZER
1	EA	HEAD SEAL	429AA [1 @ HEAD]	AA	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	8655A	A	ZER
1	EA	DOOR CONTACT	679-05 (TO SUIT DR MTL)	BLK	SCE

NOTE: MOUNT SECURITY ASTRAGAL ABOVE AND BELOW LOCK GUARD

Hardware Group No. 07

For use on Door #(s):
D-102A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4040XP TOP JAMB LONG ARM	689	LCN
2	EA	FLUSH CEILNG MTG PLT	4040XP-18G	689	LCN
2	EA	KICK PLATE	8400 150MM X LDW	630	IVE
2	EA	JAMB SEAL	328AA [2 @ JAMBS]	AA	ZER
1	EA	HEAD SEAL	429AA [1 @ HEAD]	AA	ZER
1	EA	ASTRAGAL	43STST X SECURITY SCREW	STST	ZER
2	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	8655A	A	ZER
2	EA	DOOR CONTACT	679-05 (TO SUIT DR MTL)	BLK	SCE

Finish Hardware

Hardware Group No. 08

For use on Door #(s):
D-103

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 EDA	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Hardware Group No. 09

For use on Door #(s):
D-104A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	SURFACE CLOSER	1461 EDA	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Hardware Group No. 10

For use on Door #(s):
D-104B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	DEADLATCH	4900	628	ADA
1	EA	DEADLATCH PADDLE	4590	628	ADA
1	EA	MORTISE CYLINDER	20-013 EV29 S	626	SCH
1	EA	PUSH/PULL BAR	9145EZHD-12"-NO	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP TOP JAMB LONG ARM	689	LCN
1	EA	FLUSH CEILNG MTG PLT	4040XP-18G	689	LCN
1	EA	Perimeter Seal	By Aluminum frame manufacturer		
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	8655A	A	ZER

Finish Hardware

Hardware Group No. 11

For use on Door #(s):
D-105

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 DEL REG	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	SMOKE SEAL	188SBK PSA	BK	ZER

Hardware Group No. 12

For use on Door #(s):
D-106

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	OFFICE LOCK	ND50P6D SPA	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 13

For use on Door #(s):
D-107A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-35A-NL-OP 24 VDC	626	VON
1	EA	RIM CYLINDER	20-021 EV29 S	626	SCH
1	EA	45 DEGREE OFFSET PULL	8145EZHD	630	IVE
1	EA	SURF. AUTO OPERATOR	9542 AS REQ (120/240 VAC)	ANCLR	LCN
1	EA	KEYSWITCH	8310-806K	BLK	LCN
2	EA	ACTUATOR, WALL MOUNT 6" DIA	8310-852T	630	LCN
2	EA	ESCUTCHEON 6" DIA	8310-876	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	WIRE HARNESS	CON-WIDTH		SCH
1	EA	WIRE HARNESS	CON-6W		SCH
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC		VON

Finish Hardware

Hardware Group No. 14

For use on Door #(s):
D-108A
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D SPA	626	SCH
1	EA	SURFACE CLOSER	1461 CUSH	689	LCN
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE

Hardware Group No. 15

For use on Door #(s):
D-108B
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P6 17B	626	SCH
1	EA	INTERFACE BOX	JB7		VON
1	EA	ELECTRIC STRIKE	6211 FS CON	630	VON
1	EA	SURF. AUTO OPERATOR	9131 MS AS REQ (120 VAC)	ANCLR	LCN
1	EA	AURA PUSH TO LOCK	CM-46/8/GRF/SFE1	630	CAM
2	EA	ILLUMINATED ACTUATOR	CM-46/4/GRF/SFE1	630	CAM
1	EA	LED ANNUNCIATOR	CM-AF500		CAM
1	EA	EMERGENCY CALL KIT	CX-WEC10K2		CAM
1	EA	KICK PLATE	8400 255MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	ADVANCED LOGIC RELAY	CX-33		CAM
1	EA	WIRE HARNESS	CON-6W		SCH
1	EA	DOOR CONTACT	679-05 (TO SUIT DR MTL)	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-8F 120/240 VAC		VON

Hardware Group No. 16

For use on Door #(s):
D-108C D-108D D-108E D-108F
Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4	652	IVE
1	EA	PRIVACY LOCK W/IND	L9040 17B L283-722	626	SCH
1	EA	KICK PLATE	8400 150MM X LDW	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE

Finish Hardware

Hardware Group No. 17

For use on Door #(s):
D-107B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-35A-NL-OP 24 VDC	626	VON
1	EA	RIM CYLINDER	20-021 EV29 S	626	SCH
1	EA	45 DEGREE OFFSET PULL	8145EZHD	630	IVE
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURF. AUTO OPERATOR	9542 AS REQ (120/240 VAC)	ANCLR	LCN
1	EA	KEYSWITCH	8310-806K	BLK	LCN
2	EA	ACTUATOR, WALL MOUNT 6" DIA	8310-852T	630	LCN
2	EA	ESCUTCHEON 6" DIA	8310-876	689	LCN
1	EA	Perimeter Seal	By Aluminum frame manufacturer		
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	8655A	A	ZER
1	EA	WIRE HARNESS	CON-WIDTH		SCH
1	EA	WIRE HARNESS	CON-6W		SCH
1	EA	DOOR CONTACT	679-05 (TO SUIT DR MTL)	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC		VON

Hardware Group No. 18

For use on Door #(s):
MISC ITEMS

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	WALL KEY CABINET	C-90		TAH
3	EA	Extractor tool	35-057		SCH
50	EA	KEY BLANKS	35-270		SCH
4	EA	CUT CONSTRUCTION KEY	48-097		SCH
5	EA	MASTER KEY	49-004		SCH

END OF SECTION

Project Title: **SSM DOWNTOWN CIVIC PLAZA**
QUEEN STREET SOUTH SERVICE BUILDING
SAULT STE. MARIE, ON. P6A2A3

Date: MAR. 4, 2022

The following revisions and supplementary instructions shall be part and parcel of the Tendering Documents and shall supersede the Drawings and/or Specifications where applicable.

MECHANICAL

.1 DRAWING M0.1 Revised plumbing fixture schedule, the addition of eye-wash/shower and hose bibb. Refer to drawing M0.1

.2 DRAWING M1.1 Addition of eye-wash/shower, hose bibb and all associated drainage, venting, and dcw/dhw piping. Refer to attached drawing M1.1.

.3 DRAWING M1.2 Revised sump pit/pump location and associated sanitary piping. The addition of two floor drains on the basement level and all associated sanitary piping and venting. Refer to attached drawing M1.2.

GENERAL MECHANICAL REQUIREMENTS

1. CONFORM TO INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS AND GENERAL REQUIREMENTS.
2. THIS SECTION APPLIES TO AND GOVERNS THE WORK OF ALL SECTIONS OF DIVISION 15.
3. PERFORM WORK IN ACCORDANCE WITH THE FULL INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS AS REQUIRED TO RESULT IN COMPLETE OPERATING SYSTEMS.
4. THE DRAWINGS SHOW THE ARRANGEMENT AND GENERAL DETAIL OF THE WORK. IT IS NOT PRACTICABLE ON THE DRAWINGS WITH REGARD TO SIZES, LOCATIONS, GRADING, ARRANGEMENTS AND INSTALLATION OF DETAILS, THE BRAND AND CONNECTIONS THERETO ARE ONLY SHOWN MORE OR LESS IN DIAGRAM EXCEPT WHERE A PERTINENT FACT IS THE DRAWINGS MAY INCLUDE DETAILS SHOWING THE EXACT LOCATIONS AND ARRANGEMENTS REQUIRED.
5. BEFORE SUBMITTING TENDERS, EXAMINE SITE, AND ALL DRAWINGS. EXTRAS WILL NOT BE ALLOWED FOR FAILURE TO DO SO.
6. PROVIDE ALL LABOUR, MATERIALS AND EQUIPMENT NECESSARY TO EXECUTE THE WORK SHOWN AND DESCRIBED. INSTALLATION OF MATERIALS SHALL MEET ALL APPLICABLE MECHANICAL CODES AND ASSOCIATED REQUIREMENTS UNDER ONBC AND OBC STANDARDS.
7. OBTAIN ALL PERMITS REQUIRED FOR THE INSTALLATION OF MECHANICAL TRADES WORK. ARRANGE FOR INSPECTIONS AND TESTS THEREWITH AND PAY ALL FEES AND CHARGES FOR THE PERMITS, INSPECTIONS AND TESTS. OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT.
8. MAINTAIN LIABILITY INSURANCE TO INDEMNITY OWNER AND THE CONTRACTOR FROM ANY AND ALL CLAIMS UNDER THE WORKER'S COMPENSATION ACT.
9. ALL MATERIALS SHALL CONFORM TO CSA, NFPA AND ITS REQUIREMENTS AND SHALL BEAR CSA LABEL. GAS FIRED EQUIPMENT SHALL BEAR CGA LABEL.
10. ILLUMINATE LIGHT, POWER AND WATER BY GENERAL CONTRACTOR.
11. ALL CUTTING AND PATCHING FOR MECHANICAL WORK WILL BE THE RESPONSIBILITY OF THIS SUBCONTRACTOR WHO SPECIALIZED TRADES TO DO THIS WORK.
12. PROVIDE TEMPORARY BUILDINGS AND MATERIAL STORAGE AS REQUIRED AND BE RESPONSIBLE FOR ANY LOSS OR DAMAGE THEREIN.
13. SUBMIT SAMPLES OF MATERIALS WHEN REQUESTED.
14. SUBMIT 7 COPIES OF SHOP DRAWINGS FOR REVIEW COVERING MAJOR MANUFACTURED ITEMS, S. KANS, PLUMBING FIXTURES, VAT SHEETS, ETC.
15. SUPPLY AND LOCATE ALL BASES, SUPPORTS, SLEEVES, CURBS, ETC. REQUIRED FOR THIS WORK. FLASHING BY ROOF TRADES, COUNTER FLASHING BY THIS CONTRACTOR.
16. UNLESS OTHERWISE NOTED, ALL MOTORS OVER 1/2 HP SHALL BE OF 346-1,000 VOLTS.
17. SUPPLY MOTOR STARTERS, WITH OVERLOAD PROTECTION AND DISCONNECT SWITCHES, FOR TOMORROW MECHANICAL EQUIPMENT AND HAND OVER TO ELECTRICAL CONTRACTOR FOR INSTALLATION. THIS DOES NOT INCLUDE ROTATION SWITCHES, UNLESS STATED SPECIFICALLY.
18. ALL POWER WIRING BY ELECTRICAL CONTRACTOR. CONTROL AND INTERLOCKING BY MECHANICAL CONTRACTOR.
19. SUPPLY AND INSTALL ALL NECESSARY ACCESS DOORS FOR MECHANICAL EQUIPMENT WHERE NECESSARY DOORS SHALL BE PAINTED TO SUIT FINE ASSEMBLY FINISH.
20. EXCAVATION AND BACK FILLING FOR MECHANICAL WORK SHALL BE CARRIED OUT BY DIV. 2. THIS CONTRACTOR SHALL SEED THE PIPE AND BACK FILL TO 12" ABOVE PIPE. TO USE ONLY 2 GRADES OF MATERIALS, SAND AND EARTH.
21. PIPE HANGERS SHALL BE CLEVIS TYPE WITH MALLEABLE BODY. FOR COPPER PIPE USE PLATED HANGERS. DO NOT SUPPORT EQUIPMENT OR PIPING FROM LIGHT ROOF DECK WITHOUT REINFORCING FROM ARCHITECTS. SUPPLY AND INSTALL NECESSARY STEEL TO TRANSFER LOAD TO STRUCTURAL MEMBERS.
22. ALL SCREWED PIPE WORK, 50MM, COPPER 8102.3, SHALL BE SEPARATELY USING GASKETS OF EMPCO DIELECTRIC FITTINGS.
23. INSTALL DIMPLE PLASTIC ESCUTCHEONS WHERE BRANCH LINES PASS THROUGH FINISHED SURFACES.
24. MAINTAIN AN ACCURATE DIMENSIONAL RECORD OF ALL UNDERGROUND PIPING AND ALL DEVIATIONS FROM AND CHANGES IN ABOVE GROUND PIPING. DO NOT BACK FILL EQUIPMENT FROM THE DRAWINGS. PREPARE TWO COPIES OF RECORD DRAWINGS, FILED AT THE JOB SITE AND SUBMIT TO THE CONSULTANT AT THE COMPLETION OF THE JOB.
25. ALL SURFACES MUST BE LEFT CLEAN AND PAINTED OR PLATED AS GENERAL TRADES.
26. IDENTIFY ALL PIPING AND STENCILS OF COLOUR CODES AND DIRECTIONAL ARROWS.
27. IDENTIFY ALL FANS, STARTERS, PLATES, CONTROL AND ALL OTHER EQUIPMENT AS TO SERVICE ON A BLACK LAMACOID ENGRAVED NAMEPLATE WITH WHITE LETTERS, 12MM HIGH MINIMUM.
28. ON COMPLETION OF THE WORK, ENSURE THAT THE ENTIRE INSTALLATION IS LEFT IN PERFECT ORDER READY FOR OPERATION.
29. PROVIDE THREE COPIES OF COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT SUPPLIED UNDER THIS CONTRACT.
30. SEND INSTRUCTIONS, IN LOOSE LEAF FORM IN THREE VOLUMES, AS REQUIRED, INCLUDE A COMPLETE INDEX, WHEN WORK THAN ONE VOLUME IS REQUIRED, INCLUDE IN THE FIRST BOOK A DUPLICATE INDEX OF ALL VOLUMES, AND AN ALPHABETICAL INDEX IN EACH SUCCEEDING VOLUME ACROSS THE FOLLOWING HEADINGS:
   - SEQUENCE DIAGRAMS OF MECHANICAL, ELECTRICAL, AS AND/OR GAS SYSTEMS, CONTROL SHOP DRAWINGS AND OPERATING SEQUENCES INCLUDING WIRING OF STARTERS WITH NUMBERING AND LETTERING TO AGREE WITH SHOP DRAWINGS. ELECTRICAL DIAGRAMS SHALL BE INTEGRATED WITH MECHANICAL EQUIPMENT OPERATING INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN PROCEDURE ASSEMBLY INSTRUCTIONS AND RECOMMENDED CYCLE OF LUBRICATION FOR EACH ITEM OF EQUIPMENT, INCLUDING LUBRICANTS RECOMMENDED BY MANUFACTURERS OF EQUIPMENT. LIST OF MANUFACTURERS OF EQUIPMENT, ADDRESS OF NEAREST SERVICE ESTABLISHMENT, LIST OF RECOMMENDED SPARE PARTS TO BE STOCKED AT THE SITE, AND COMPLETE PARTS LIST AND ASSEMBLY DRAWINGS OF EQUIPMENT AS SUPPLIED. WHERE MANUFACTURERS' BOOKS AND DIAGRAMS APPLY TO EQUIPMENT OF A MODEL NOT SUPPLIED, THEY ARE MANUFACTURED BY BE SUPPLIED OF THE EQUIPMENT OR ANY SUBSTITUTE AS A COMPONENT PART OF AN ITEM OF EQUIPMENT.
31. THE CONTRACTOR SHALL OBTAIN FINAL PAYMENT ITS INVOICE, ACCOMPANIED ALL MATERIALS AND WORKMANSHIP SUPPLIED BY HIM IN THE PERFORMANCE OF THIS CONTRACTOR FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL, WHEN CALLED UPON, MAKE GOOD WITHOUT FURTHER COST TO THE OWNER SUCH DEFECTS AS MAY APPEAR WITHIN THAT PERIOD.
32. ALL FLOOR DRAINS AND AS ARE TO BE EQUIPPED WITH ASSECT SCREWS.

PIPING AND PIPING ACCESSORIES

1. ALL WORK SHALL BE EXECUTED BY LICENSED PLUMBERS.
2. ALL PLUMBING AND DRAINAGE COMPONENTS SHALL BE INSTALLED AS REQUIRED BY ONTARIO PLUMBING CODE AND ONTARIO BUILDING CODE, REVISED TO DATE, AND SHALL MEET THE REQUIREMENTS OF ALL PROVINCIAL AND MUNICIPAL AUTHORITIES HAVING JURISDICTION.
3. INCLUDE ALL PIPING, FITTINGS AND EQUIPMENT SHOWN ON DRAWINGS OR DESCRIBED IN SPECIFICATIONS. ALL ITEMS NOT MENTIONED BUT UNDERSTOOD TO BE NECESSARY TO COMPLETE THE PLUMBING SYSTEM SHALL BE INCLUDED.
4. ALL BURIED SANITARY DRAINAGE PIPING SHALL BE PVC SDR 35 WITH SOLVENT JOINTS.
5. ALL BURIED STORM PIPING SHALL BE PVC SDR 35.
6. CONTRACT EXTENDS TO 5'-0" OUTSIDE THE BUILDING.
7. ALL ABOVE GROUND SANITARY DRAINAGE PIPING SHALL BE CAST IRON MECHANICAL JOINT OR DWV COPPER. PVC PIPES MAY BE USED IN CORE AREA WHERE CEILING SPACE NOT USED AS PLENUM.
8. ALL ABOVE GROUND STORM DRAINAGE SHALL BE CAST IRON MECHANICAL JOINT OF TRANSIT COUPLE FITTING. PVC PIPES MAY BE USED IN CORE AREA WHERE CEILING SPACE NOT USED AS PLENUM.
9. ABOVE GROUND WATER PIPING SHALL BE TYPE 'L' COPPER (LW KEVS SOLDER JOINTS. PIPING TO BE CERTIFIED TO CSA STANDARD B 64.10 STANDARD.
10. BURIED WATER PIPING SHALL BE COPPER TYPE 'K'.
11. ALL ABOVE GROUND VENT PIPING SHALL BE DWV COPPER OR GALVANIZED STEEL. PVC PIPES MAY BE USED IN CORE AREA WHERE CEILING SPACE NOT USED AS PLENUM.
12. ALL BURIED VENT PIPING MAY BE ABS PLASTIC SOLVENT WELD.
13. VALVES UP TO 3" SHALL BE BRONZE BALL VALVES.
14. SUPPLY AND INSTALL ALL PLUMBING FIXTURES, CLEAN OUTS, HOSE BIBS, FLOOR DRAINS, COMBINATION DRAINS, ROOF DRAINS, ETC.
15. CLEAN OUTS SHALL BE INSTALLED AS REQUIRED BY CODE AND WHERE SHOWN AND SHALL SUIT FLOORING MATERIAL.
16. MAKE ALL NECESSARY ARRANGEMENTS WITH ALL CHANGES AND DO ALL NECESSARY WORK FOR THE INSTALLATION OF A NEW GAS SERVICE WHERE SHOWN ON ALL DRAWINGS. GAS SERVICE SHALL BE AS LOCATED IN NATURAL GAS AND PROPANE INSTALLATION CODE B149.1-00
17. ALL GAS PIPING TO BE PAINTED YELLOW AND IDENTIFIED AS REQUIRED BY GAS CODE.
18. DOMESTIC COLD AND HOT WATER PIPING SHALL BE INSULATED WITH 1" DIA. FIBERGLAS PIPE INSULATION WITH ASJ. HORIZONTAL RUNS OF SANITARY AND STORM UPWARD SHALL BE INSULATED TO A SIMILAR MANNER. ALL EXPOSED SPACE FINISH WITH CANVAS OF PVC JACKETING. INSULATE ALSO COLD WATER METERS.
19. SUPPLY ALL NECESSARY TRAPS AND GAS TIGHT COVERS FOR ALL SUMPS, VENT AS REQUIRED.
20. SUPPLY ALL SUMP PUMPS, C/W DISC AND CHECK VALVE ON DISCHARGE LINE.
21. SEE FIXTURE SCHEDULE FOR PLUMBING FIXTURE TYPES.
22. SUPPLY AND INSTALL WATER HANDLE OR SCREW FIXTURE STOP VALVE ON THE HOT AND COLD WATER SUPPLY TO EVERY FIXTURE OR UNIT IN ADDITION TO THE VALVE OR FAUCET ON THE FIXTURE ITSELF.
23. PROJECT ALL FIXTURES UNITS HANDED OVER TO THE OWNER ALL FIXTURES SHALL BE C/W NECESSARY RIM, STRAP SUPPORTS, SUPPLY TAIL PIECES, PIPES, GASKETS, ETC.
24. DOMESTIC WATER SERVICE TO BE STERILIZED TO SAULT STE. MARIE, ONTARIO STANDARDS.
25. GAS PIPING SHALL BE STANDARD WEIGHT BLACK STEEL PIPE WITH STANDARD WEIGHT MALLEABLE OR SCREW FITTINGS AS REQUIRED BY LOCAL REGULATIONS VALVES SHALL BE APPROVED TYPE (LEVER OPERATED CODES, ACTUAL AND TEST PIPING IN ACCORDANCE WITH THE NATIONAL GAS AND PROPANE INSTALLATION CODE, AS AMENDED TO DATE, TOGETHER WITH ANY LOCAL RULES AND REGULATIONS. WELD, VENT AND PROTECT CONCEALED OR BURIED PIPING IN ACCORDANCE WITH REQUIREMENTS OF LOCAL GAS COMPANY. DO NOT MAKE INSTALLATION UNTIL APPROVAL IS OBTAINED FROM THE GAS COMPANY.

PLUMBING LEGEND

SYMBOL	SYMBOL MEANING	SYMBOL	SYMBOL MEANING
	FLOOR DRAIN		THERMOMETER
	SWITCH PILOT VALVE		FIRE HOSE CONNECTION
	MIXING VALVE		DRAIN CLEAN-OUT
	UNION		DRAIN WITH CLEAN-OUT UP TO FLOOR
	PIPE UP		HOSE BIB
	PIPE DOWN		SHOWER HEAD
	SAMPLE PIPE		TRAP SEAL PRIMER
	STRAINER		SPRINKLER HEAD UPRIGHT
	GATE VALVE		SPRINKLER HEAD CONCEALED
	CHECK VALVE		SPRINKLER HEAD PENDENT
	BALANCING VALVE		SPRINKLER HEAD SIDEWALL
	PRESSURE REDUCING VALVE		EXPANSION JOINT OR LOOP
	AUTOMATIC CONTROL VALVE		INTERIOR DRAIN OR FLOOR
	PRESSURE DIFFERENTIAL VALVE		SHARPE PRESSURE CONNECTION
	SWING GAS VALVE		FIRE HOSE CABINET
	SWING GAS VALVE (LOCKING)		WALL HOSE SUPPLY
	SOLENOID GAS VALVE		WALL HOSE VALVE
	SOLENOID GAS VALVE (LOCKING)		ANGLE BALANCING VALVE
	GAS COCK		FLOW SWITCH
	HEAT PIPE BELOW GRADE		METER
	STORM DRAIN		GAS FLOW PRESSURE
	VENT LINE		STRAINER
	DOMESTIC LINE (HOT)		PRESSURE GAUGE WITH GAUGE COCK
	DOMESTIC LINE (COLD)		PUMP
	NATURAL GAS PIPE		SUMP PUMP OR AS SHOWN
	CONDENSATE DRAIN		
	RAIN WATER LEADER		VENT THROUGH ROOF

RELATIVE BRANCH AND MAIN SIZES

SIZE OF MAIN IN (mm)	NO. & SIZE OF BRANCHES - FULL FLOW IN (mm)
1/2"ø (12M)	TWO - 1/2"ø (12M)
3/4"ø (19M)	TWO - 1/2"ø (12M)
1"ø (25M)	TWO - 3/4"ø (19M)
1-1/4"ø (32M)	TWO - 1"ø (25M) OR ONE 1"ø (25M) AND TWO 3/4"ø (19M)
1-1/2"ø (38M)	TWO - 1-1/4"ø (32M) OR ONE 1-1/2"ø (38M) AND TWO 1"ø (25M)
2"ø (50M)	TWO - 1-1/2"ø (38M) OR ONE 1-1/2"ø (38M) AND TWO 1-1/4"ø (32M)
2-1/2"ø (63M)	TWO - 1-1/2"ø (38M) OR TWO 1-1/4"ø (32M) OR ONE 2"ø (50M) AND TWO 1-1/4"ø (32M)
3"ø (75M)	ONE 2-1/2"ø (63M) AND ONE 2"ø (50M) OR TWO 2"ø (50M) AND TWO 2-1/2"ø (38M)
3-1/2"ø (87M)	TWO - 2-1/2"ø (63M) OR ONE 3"ø (75M) AND ONE 2"ø (50M) OR FOUR 2"ø (50M)
4"ø (100M)	ONE 3-1/2"ø (88M) AND ONE 2-1/2"ø (63M) OR TWO 3"ø (75M) OR THREE 2-1/2"ø (63M) AND ONE 2"ø (50M) OR SIX 2"ø (50M)

ALLOWABLE NUMBER OF 1"ø (25M) FLUSH VALVES

PIPE SIZE IN (mm)	NUMBER OF 1"ø (25M) FLUSH VALVES
1-1/4"ø (32M)	1
1-1/2"ø (38M)	2-4
2"ø (50M)	5-12
2-1/2"ø (63M)	13-20
3"ø (75M)	21-40
4"ø (100M)	41-100

TWO 3/4"ø (19M) FLUSH VALVES ARE ASSUMED EQUAL TO ONE 1"ø (25M) FLUSH VALVE, SEE LAW 16 SERVED BY A 1"ø (25M) PIPE. WATER PIPE SIZING MUST BE SUPPORTED BY CALCULATION OF DEMAND FACTOR, AVAILABLE PRESSURE, AND LENGTH OF RUN.

FIRE EXTINGUISHER SCHEDULE

IDENTIFICATION NUMBER	MANUFACTURER/MODEL
(E) BASE	PORTABLE SIGNED PRESSURE DRY CHEMICAL FIRE EXTINGUISHER, WALL MOUNT BRACKETS, RED POWDER PAINT FINISH, STAINLESS STEEL HOSE CLIP BANDS. PRODUCT EQUAL TO KIDDE M, COLVINS, MODEL #5C-10C.

SCHEDULE OF PLUMBING EQUIPMENT

SYMBOL	FIXTURE TYPE	FIXTURE SPECIFICATION
WHC	BARRIER FREE FLOOR MOUNT FLUSHOMETER VALVE CLOSET	BARRIER FREE FLOOR MOUNT FLUSHOMETER VALVE CLOSET WITH CHEMICALLY RESISTANT ELONGATED SEAT, WHITE VITREOUS CHINA ELONGATED, HIGH EFFICIENCY 4.8 LPF, 1.6 GPF, 10" HEIGHT ELONGATED, PERMANENT PORCELAIN SURFACE, SLOW CLOSING FLUSH VALVE, PRODUCT EQUAL TO AMERICAN STANDARD, MADISON MODEL #2349.151
WC	FLOOR MOUNT FLUSH VALVE WATER CLOSET	FLOOR MOUNT FLUSH VALVE WATER CLOSET, WHITE VITREOUS CHINA, HIGH EFFICIENCY 1.6 GPF, 10" HEIGHT ELONGATED, PERMANENT PORCELAIN SURFACE, SLOW CLOSING FLUSH VALVE, PRODUCT EQUAL TO AMERICAN STANDARD, MADISON MODEL #2349.151
WL	BARRIER-FREE WALL HUNG LAVATORY	WHITE WALL HUNG VITREOUS CHINA LAVATORY, FRONT OVER FLOW, SELF DRAINING RIM, SINGLE CENTER FAUCET HOLE, CONCEALED ARM SUPPORT, PRODUCT EQUAL TO AMERICAN STANDARD, MODEL LUCERNE #0356.121, C/W AMERICAN STANDARD 1.0 GPM METERING FAUCET #7386.121
L	WALL HUNG LAVATORY	WHITE WALL HUNG VITREOUS CHINA LAVATORY, FRONT OVER FLOW, SELF DRAINING RIM, SINGLE CENTER FAUCET HOLE, CONCEALED ARM SUPPORT, PRODUCT EQUAL TO AMERICAN STANDARD, MODEL LUCERNE #0356.121, C/W AMERICAN STANDARD 1.0 GPM METERING FAUCET #7386.121 (4 INCH CTR)
WSB	WOP SINK BASIN	MOLDED STONE, 16"x 21" x 10", C/W 1" TRAP, PIPE, CLOSE STRAINER AND 3/4" INSERT WITH TRIANGULAR COVER, SERVICE FAUCET WITH INTEGRAL VACUUM BREAKER, CHROME PLATED BRASS, STAINLESS STEEL WALL BRACKETS, PRODUCT EQUAL TO FIAT, MODEL #WSB-3624 C/W 530-AL #32-AL #888-CC, T-340-AL, #SERIES
FD	FLOOR DRAIN	ZURN ZN415-5Y-V FLOOR DRAIN WITH CLOSET HEAVY-DUTY NICKEL BRONZE STRAINER TYPICAL OF MOST AREAS.
TRAP	TRAP SEAL PRIMER	PRECISION PLUMBING PRODUCTS, MODEL P-11 AND P-12 TRAP SEAL PRIMER VALVE, SIZE AS REQUIRED FOR THE NUMBER OF FLOOR DRAINS CONNECTED.
CO	CLEAN OUT (GENERAL)	ZURN ZN-1400-HS TYPE CO-WT - SPILT HEAVY-DUTY FLOOR CLEAN-OUT ADJUSTABLE
WHMD	NON-FREEZE WALL HYDRANT WITH INTEGRAL VACUUM BREAKER	WATTS HY-725 NON-FREEZE WALL HYDRANT, WITH MS BOX, INTEGRAL VACUUM BREAKER
TD	TRENCH DRAIN	CHANNELS SHALL BE 152MM(6") LONG, 305MM WIDE AND 203MM WITH THROAT, STAINLESS STEEL FLANGED CONNECTIONS, PADDED SELF DRAINING BOTTOM, 1.0MM BASE THICKNESS, EACH BASIN PRODUCT EQUAL TO ZURN ZURN-TRENCH, MODEL #ZRN-152C
EW	EYE WASH/SHOWER	WSP EMERGENCY SHOWER AND EYE/FACE WASH PRODUCT EQUAL TO HAWS, MODEL #8308 & 8308 C/W THERMOSTATIC MIXING VALVE AND DUST COVER
WB	WALL HYDRANT	MODERATE CLIMATE WALL HYDRANT WITH CHROME PLATED FACE INTEGRAL VACUUM BREAKER PRODUCT EQUAL TO WATTS HY-450.

ADH

EXPANSION TANK SCHEDULE (WESSELS)

REF NO	MAKE / MODEL NO.	FLUID SERVICE	WEIGHT (lbs)	TANK VOLUME (gal)	CHARGING VALVE	CONNECTION (in)	COMMENTS
EXP-1	ITT-4.5	DOMESTIC WATER	20	4.5	0.302"-3/4NS	3/4	VERTICAL BLADDER ASME SECTION

ALLOWABLE NUMBER OF 1/2"ø (12M) CONNECTIONS

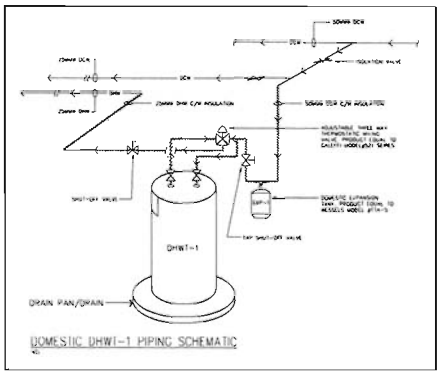
PIPE SIZE IN (mm)	AVERAGE DEMAND	100% DEMAND
1/2"ø (12M)	1	1
3/4"ø (19M)	4	5
1"ø (25M)	10	11
1-1/4"ø (32M)	20	13
1-1/2"ø (38M)	30	20
2"ø (50M)	50	35
2-1/2"ø (63M)	70	60
3"ø (75M)	125	100
4"ø (100M)	230	185

IMPERIAL TO METRIC SIZING CONVERSION

1/8"	3mm	1"	25mm	6"	75mm
1/4"	6mm	1 1/4"	32mm	3 1/2"	89mm
1/8"	8mm	1 1/2"	38mm	4"	100mm
1/2"	12mm	2"	50mm	5"	125mm
3/4"	19mm	2 1/2"	63mm	6"	150mm

WATER SUPPLY PIPE SIZE

FIXTURE OR DEVICE	MINIMUM SIZE OF SUPPLY PIPE IN (mm)
BATH TUB	1/2"ø (12M)
COMBINATION SINK AND SINK	1/2"ø (12M)
COMMERCIAL DOMESTIC	3/8"ø (10M)
DRINKING FOUNTAIN	1/2"ø (12M)
FLORAL SINK	1/2"ø (12M)
LAUNDRY TRAYS (1 OR 2 COMPARTMENTS)	1/2"ø (12M)
LAVATORY	3/8"ø (10M)
SHOWER, SINGLE HEAD	1/2"ø (12M)
SINK	
(A) KITCHEN, DOMESTIC	1/2"ø (12M)
(B) KITCHEN, COMMERCIAL	1/2"ø (12M)
(C) SERVICE, SLOP	1/2"ø (12M)
(D) SINK, WITH DIRECT FLUSH	3/4"ø (19M)
URINAL	
(A) WITH FLUSH TANK	1/2"ø (12M)
(B) WITH DIRECT FLUSH VALVE	3/4"ø (19M)
WALL HYDRANT	1/2"ø (12M)
WATER CLOSET	
(A) WITH FLUSH TANK	3/8"ø (10M) 1"ø (25M)
(B) WITH DIRECT FLUSH VALVE	



DOMESTIC DHWT-1 PIPING SCHEMATIC

ELECTRIC HEATER SCHEDULE (OUELLET)

IDENTIFICATION NUMBER	MANUFACTURER	MODEL	AIR FLOW L/s	AIR FLOW CFM	HEATING OUTPUT kW	HEATING OUTPUT BTU/hr	TEMP RISE °C	TEMP RISE °F	ELECTRICAL MOTOR HP	ELECTRICAL VOLTS	ELECTRICAL PHASE	WEIGHT lbs	WEIGHT kg	REMARKS
UH-1	OUELLET	OAT 100DH-475-1186	141.5	300	3.25	11077	-	-	-	120	1	20	9.1	C/W MOUNTING BRACKETS AND INTEGRAL THERMOSTAT
UH-2	OUELLET	OAT CH1000H4xx	330 +	700	15	34129	25	45	1/30	208	3	45	20	
UH-3	OUELLET	OAT CH1000H4xx	330 +	700	5	17060	13	23	1/30	208	3	45	20	
UH-4	OUELLET	OAT CH-HV2038	188.8	400	5	17060	31.2	56.1	1/4	208	3	198	89.5	
UH-5	OUELLET	OAT CH-HV2038-TAS	75.5	160	2	6820	-	-	-	208	1	24	10.9	

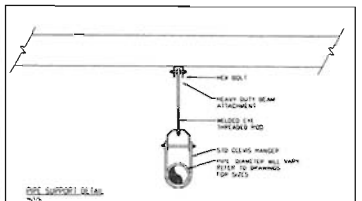
SCHEDULE OF PUMPS

TAG	SYSTEM	LOCATION	MANUFACTURER	MODEL NO	QTY	CAPACITY	HEAD (FT)	MOTOR	MOTOR	MOTOR	REMARKS
								HP	RPM	V/ph/Hz	
SP	SUMP PUMP	BASEMENT (EXACT TO PLANS)	MYERS/ FEDPRO	1HP6LE	1	80 GPM	22	1/2HP	-	115V/1/60	C/W FLOAT SWITCH, MOTOR STARTER SWITCH

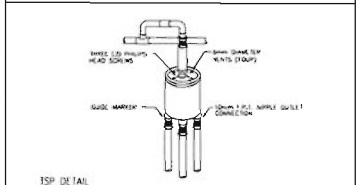
SCHEDULE OF DOMESTIC WATER HEATER

SYSTEM	LOCATION	MODEL NO	QTY	STORAGE CAPACITY (USG)	RECOVERY (GPH)	THERMAL EFFICIENCY (%)	DIMENSIONS (IN)	ELEMENTS	COMBUSTION	VENTS	WATER CONNECTION DIA. NPT	SHIPPING WEIGHT (lbs)	VOLTAGE	REMARKS
DHWT-1 (ELECTRIC)	ISE MECHANICAL	A.O. SMITH MODEL ENDT-455B6	1	50	50	-	22"ø X 48-3/4"H	4,500 WATTS	-	-	3"ø	125	208V/1PH/60HZ	

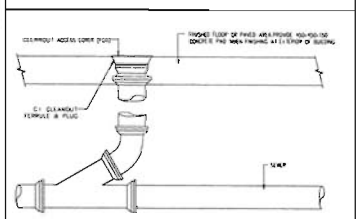
NOTES:
1. OUTPUT RECOVERY BASE AT 120°F.
2. COMPLETE WITH CONCENTRIC VERTICAL VENT KIT.
3. CONCENTRIC VENT KIT.
4. IMMERSION THERMOSTAT
5. MIXING VALVE



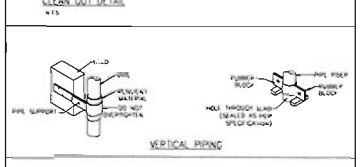
PIPE SUPPORT DETAIL
N.T.S.



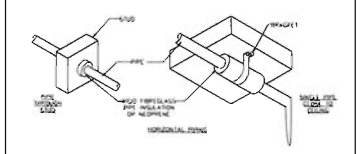
TSP DETAIL
N.T.S.
*CONTRACTOR SHALL CONFIRM SIZE ACCORDINGLY



CLEAN OUT DETAIL
N.T.S.



VERTICAL PIPING



PIPE VIBRATION DETAIL
N.T.S.

mgp
architects + engineers inc
123 East Street
Sault Ste. Marie, ON
P6A 3C7
Tel. 705.942.9494 mgp-arch-eng.ca

E.J. PRINCIPE
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON, P6A 2A3

5		
4	REVISED AS PER ASSIT	MAR. 4, 2022
3	ISSUED FOR TENDER & PERMIT	FEB. 25, 2022
2	COORDINATION REVIEW	FEB. 22, 2022
1	ISSUED FOR PRICING	OCT. 14, 2021
#	Revision	Date

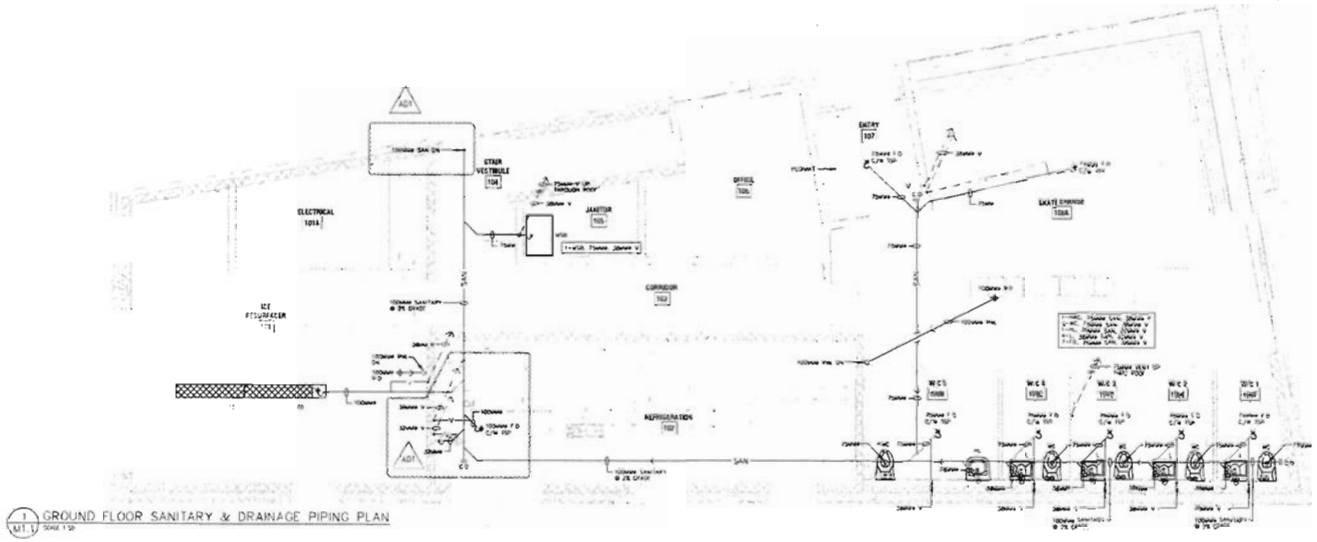
Revisions

PLUMBING NOTES, SCHEDULES DETAILS AND LEGENDS

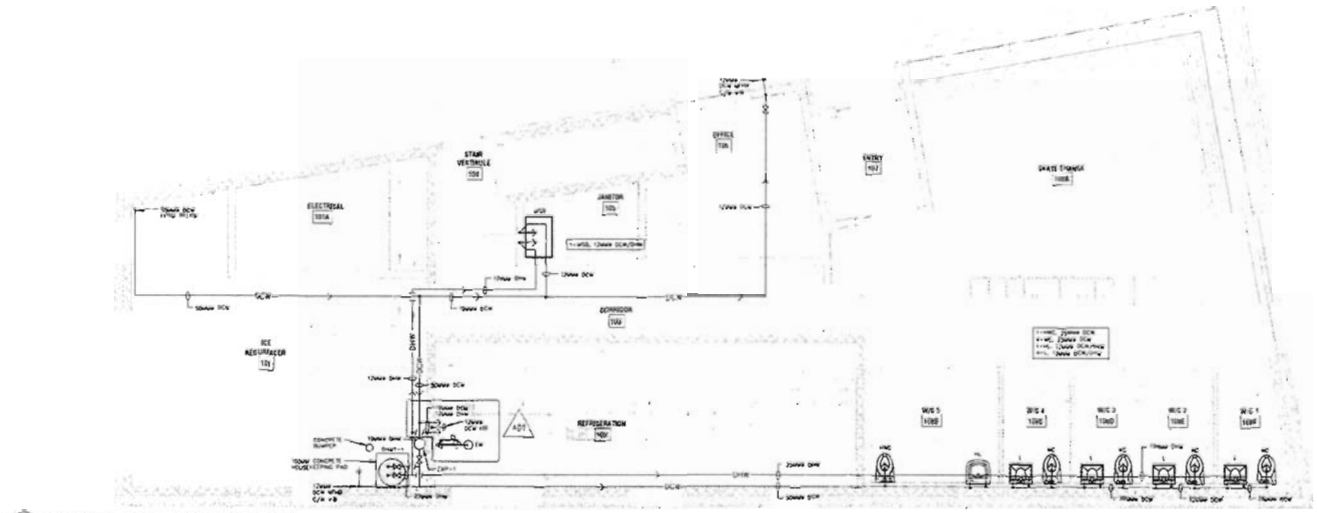
Scale	AS NOTED
P.I.C.	EJP
Design	EJP
Drawn	SB
Date	MAR. 4, 2022
Plotted	

Number
2003 2003MP500

M0.1-AD1



1 / M1.1 GROUND FLOOR SANITARY & DRAINAGE PIPING PLAN



2 / M1.1 GROUND FLOOR DCW/DHW PIPING PLAN

mgp
architects + engineer inc
613 Bay Street
South Ste. Marie, ON
P6A 1X7
tel: 705.942.5494 mgp-spcm-arch.ca

E.J. PRINCIPE
LICENCED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

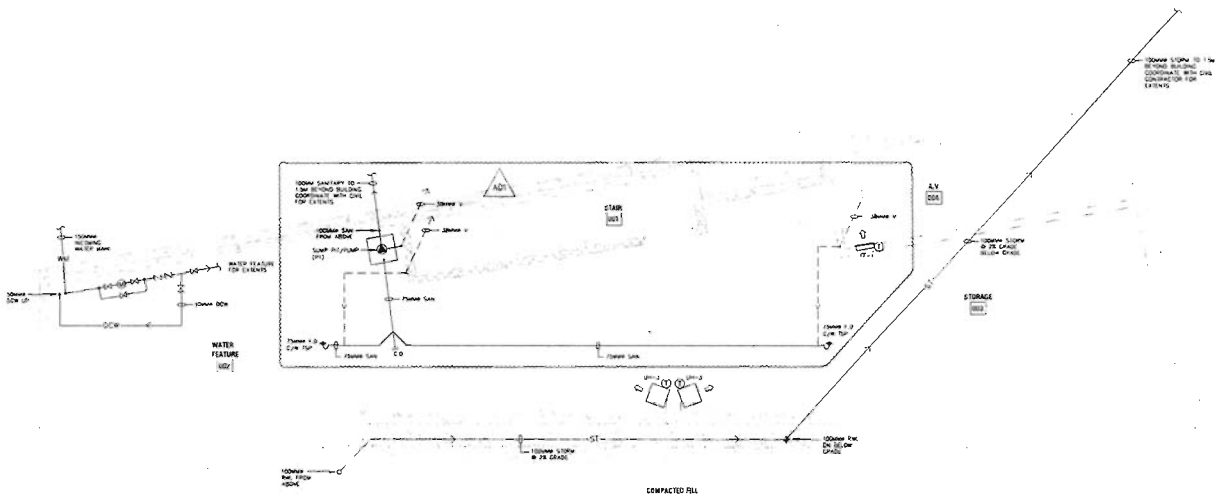
N

Revisions

SANITARY AND DRAINAGE/DCW/DHW PIPING PLAN

Scale: 1/8" = 1'-0"
By: E.J.P.
Design: E.J.P.
Drawn: YC
Date: MAR. 2, 2021
Checked:

Number
M1.1-AD1



1 / M1.2 BASEMENT SANITARY & DRAINAGE/DCW/STORM PIPING/HEATING PLAN
SCALE 1:50

mgp
architects + engineer inc.
103 East Street
Sault Ste. Marie, ON
P6A 3C7
P6. 705.942.9494

E.J. PRINCIPE
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

SSM DOWNTOWN CIVIC PLAZA
QUEEN STREET SOUTH
SERVICE BUILDING
SAULT STE MARIE, ON. P6A 2A3

4	
3	
2	ISSUED FOR TENDER & PERMIT
1	COORDINATION REVIEW
	ISSUED FOR PRICING
#	Revisions

Revisions

BASEMENT
DCW/STORM/HEATING
PLAN

Scale	AS NOTED
M.E.C.	EJP
Design	EJP
Drawn	RL
Date	MAR. 4, 2022
Machine	

Number
M1.2-AD1

BrookMcIlroy/

Form 2.3

Addendum No. 2

Project	**No.: 19-076**
Tender	**No.: 2022CDE-PE-02-T**
Date:	**March 15, 2022**

Project: **Sault Ste. Marie – Downtown Civic Plaza Building**

The following information supplements and/or supersedes the bid documents issued on **February 25, 2022**.

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt ofthis Addendum by inserting its number and date on the Tender Form. Failure to do so may subject bidder to disqualification.

See enclosed for additional information to clarify the tender documents previously issued.

Questions below posed by Proponents and responses are provided in red:

1. "Extension to the Question Deadline 1.8.3 until March 21, 2022"
   Question Deadline has been extended until 12:00 pm (noon), local time, on March 21, 2022.

2. "Extension to the Bid Closing Deadline 1.4.2 until April 7, 2022"
   Bid Closing Deadline has been extended until April 7th, 2022.

3. "Change the Bid Closing Time to 14:00:00, this is standard for the industry and will present better value to the project."
   Bid Closing Time has been changed to 14:00:00 on April 7th, 2022.

4. "Clarification on the bid opening, based on the project being a municipal project should it not be required to be opening publicly."
   Bid opening to be public. A Zoom Invitation will be provided through an Addendum at a later date.

5. "Change to the Bid Acceptance Period from 60 days to 30 days."
   Bid Acceptance Period has been changed from 60 days to 30 days.

6. "Change to a 2 part bid submission, this would include moving the Unit Price Bid Form Supplement, Alternative Prices Bid Form Supplement, List of Subcontractors Bid Form Supplement to 16:00:00 on the same day of bid closing"
   Bid Submission to remain as described in the contract documents. All documents to be submitted on April 7th, 2022 at 14:00:00.

END OF ADDENDUM

Project	**No.: 19-076**
Tender	**No.: 2022CDE-PE-02-T**
Date:	**March 31, 2022**

Project: **Sault Ste. Marie – Downtown Civic Plaza Building**

The following information supplements and/or supersedes the bid documents issued on **February 25, 2022.**

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt ofthis Addendum by inserting its number and date on the Tender Form. Failure to do so may subject bidder to disqualification.

See enclosed for additional information to clarify the tender documents previously issued.

1. Landscape Architectural Drawings:
   - L2.01 and L2.02 have been updated to indicate revised labelling for proposed concrete. See revised sheets L2.01 and L2.02.

Questions below posed by Proponents and responses are provided in red:

1. Clarification on the bid opening, based on the project being a municipal project should it not be required to be opening publicly.
   Bid opening will be made available by the Owner hosted via Zoom.

   In order to participate, bidder is required to Register to receive an invitation link. Registration is to be received by Bid Closing Time as listed within Tender Document package.

   Request may be submitted by either:
   a. With Tender Submission delivered, OUTSIDE of sealed Tender Package, or
   b. Send an email to: proposals.purchasing@cityssm.on.ca

   Include the following information in your request:
   Subject Line – "Project – Sault Ste. Marie Downtown Plaza Zoom Request"
   Body:
   Company Name
   Address
   Contact Person
   Phone Number
   Email Contact to send invitation

2. Can you please provide us with alternate details to provide a structural suspended slab in lieu of the precast option. Currently pre-cast suppliers are booking into mid next year for production and this will hold up the progress of the project.
   Any redesign to the contract documents would be coordinated once the contract has been awarded.

3. Can you please provide us with an alternate design to use beams in lieu of OWSJ for the roof framing. Currently there is a supply chain issue with them and would hold up the progress of the project.
   Any redesign to the contract documents would be coordinated once the contract has been awarded.

4. Can you please provide us with the supplier that was engaged for the precast concrete benches, so we can reach out to them for pricing.
   No specific supplier was engaged for the precast concrete benches.

5. I just heard from our Greenspoke supplier that the rack is not available in a Stainless Steel Finish. Our website has an error on it and we have asked them to fix it. Can you please ask the question what finish they would like? Options are Galvanized or Powder coated.
   Stainless Steel Greenspoke Ripple Bike Rack to be replaced with Powder Coat Royal RA #5005 Greenspoke Ripple Bike Rack "

6. "What do you require for Insurance on the project? Example Builders Risk?"
   Yes, for all abutting properties to the plaza project.

7. "Do you require a preconstruction building inspection done for the surrounding area. If so, what limit?"
   Yes

8. "Will the Material Testing Allowance cover all testing for the project? Ie) concrete, asphalt, compaction tests etc.?"
   Yes

9. "There is a new gas main on the drawing, with required separate pricing? Are we to include for this or is this not part of the contract? Who is responsible for the directional drilling across Bay?"
   There are two existing gas lines on site that are being relocated as part of the Downtown Plaza project. There are two new gas lines required on site—connection for the new building and the connection for the shipping container units. Enbridge will be doing both the relocation and the installation of the new gas lines. No separate pricing is required as this scope is being paid for by the Owner. Enbridge is responsible for the directional drilling across Bay.

10. "Are Geotechnical inspections covered by Owner?"
    Geotechnical inspections have been completed for the site. A Geotechnical Report as well as two (2) Soil Remediation Reports have been included in the Contract Documents. A final version of the Geotechnical Report has been included in this Addendum.

11. "Will PUC Costs for connections to existing watermain be by Owner?"
    Yes

12. "The drawings say that the removals are by the Owner. Will there be any items left on site that we will have to remove? Or do we assume area to be ready for Construction? Will these areas also have some excavation done to them?"
The Owner will be conducting the removals on site as indicated on L1.00. The Awarded Contractor is to assume that the site will be ready for construction. Excavation work as part of the site improvements is the responsibility of the Awarded Contractor.

13. "What are the requirements for restraints on the 6" Watermain?"
Watermain restraint requirements are indicated on TULLOCH civil drawing C4

14. "Will we require Nitrile Gaskets on the Watermain?"
Yes.

15. "Are we required a hydrant for fire protection on site??"
A hydrant for fire protection is not required on site.

16. "Our supplier for SM, for the skating rink, asks if we can use an alternative to the SM insulation, using a Dupont Dow CM 20, as this has been used on different ice rink projects in this area and has proved to be cost efficient for a large area!"
CIMCO does not recommend using Cladmate CM 20 as an alternative to Styrofoam XPS for insulating this outdoor refrigerated slab. CM20 is an inferior product for this application when compared to the water resistance and compressive strength of XPS. The insulation R value will be degraded more quickly over time with exposure to water/moisture. This is especially a concern since it is an outdoor rink, not indoors. The compressive strength of CM20 is lower than XPS (20psi vs. 25psi).

17. "For the Concrete densifier/ hardener do you want liquid applied densifier or dry shake hardener?"
Hardeners for the concrete have been removed from the Contract Specifications Section 03 30 00. Section 03 30 00 dated February 25, 2022 has been from struck Contract and is to be replaced in its entirety with the attached revised version in this Addendum dated March 30, 2022.

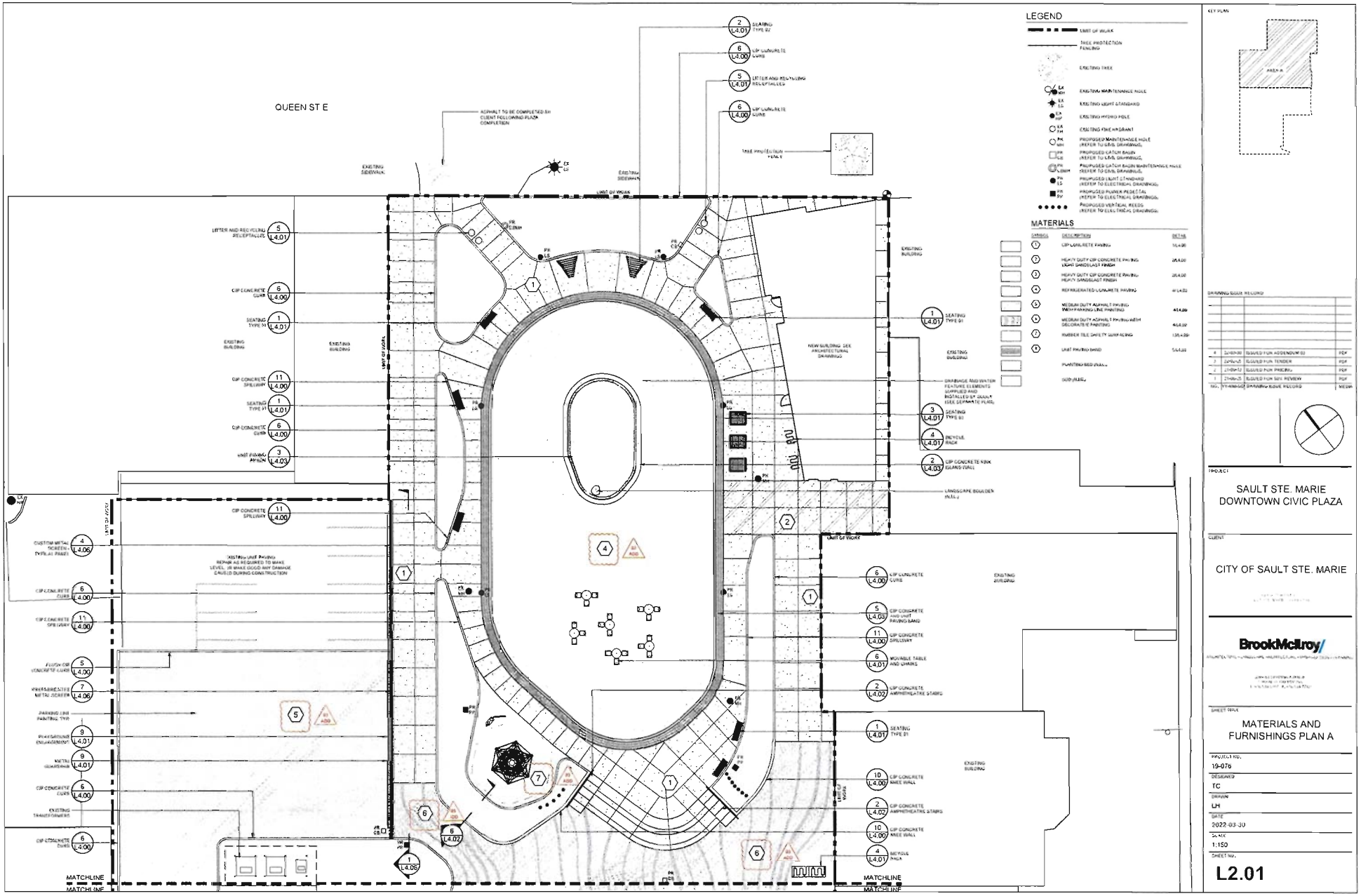
18. "Do you have a detail on what type of wood fencing you would like as an alternative to the metal screen? Is the wood alternative for the customized screen area also?"
The custom metal screen is to remain as part of the Contract. The proposed alternate is for the Omega Unik metal screen only. A detail has been provided as part of this Addendum for the wood fence alternative to Omega Unik metal screen.

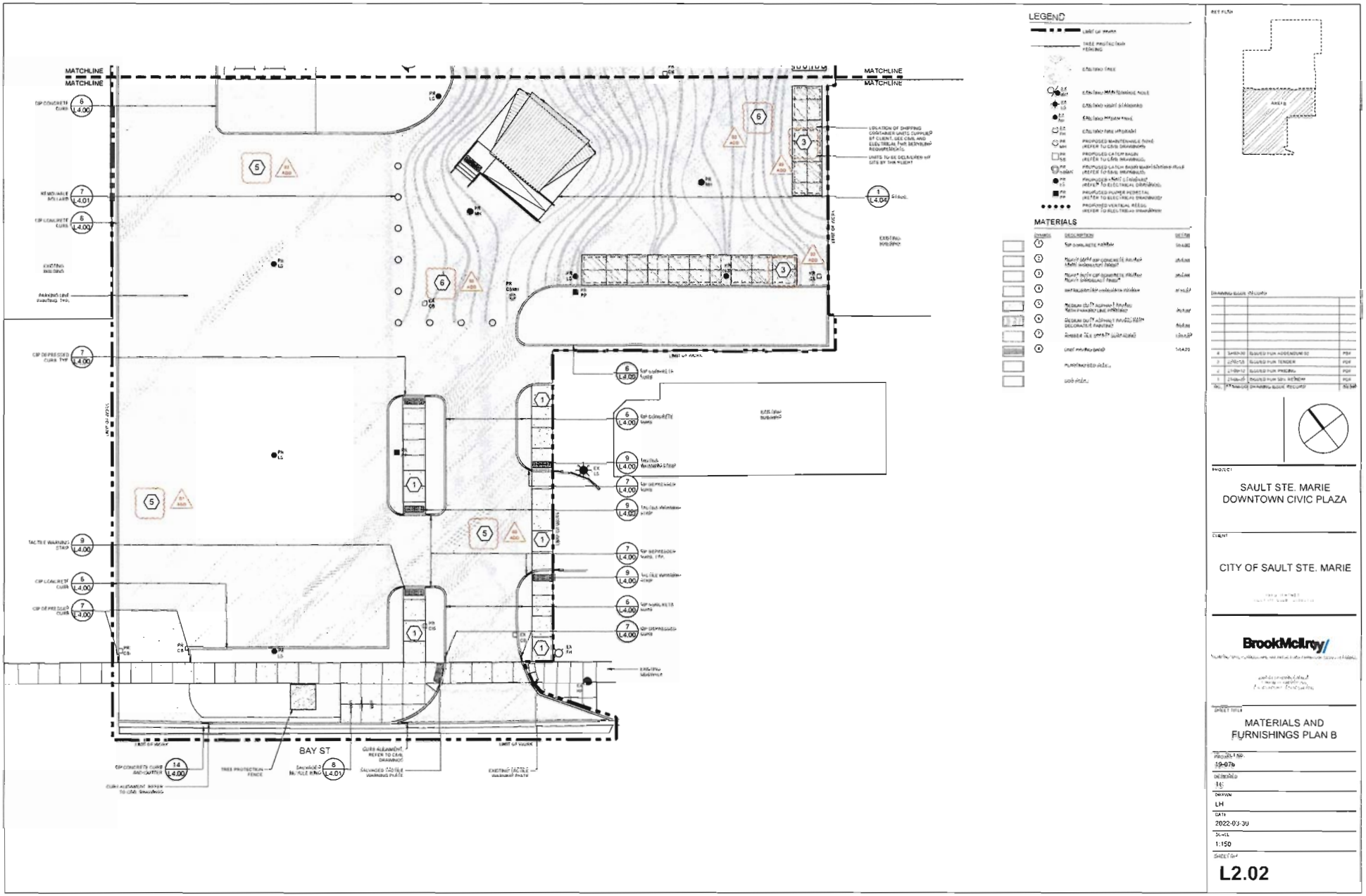
19. "How would you like the site services connected to the sea cans? Are we to just cap all services?"
TULLOCH civil drawings state to bring all services to grade and to coordinate final locations with mechanical. The Awarded Contractor to cap the services at grade as long as the water will be connected to the units prior to freezing temperatures.

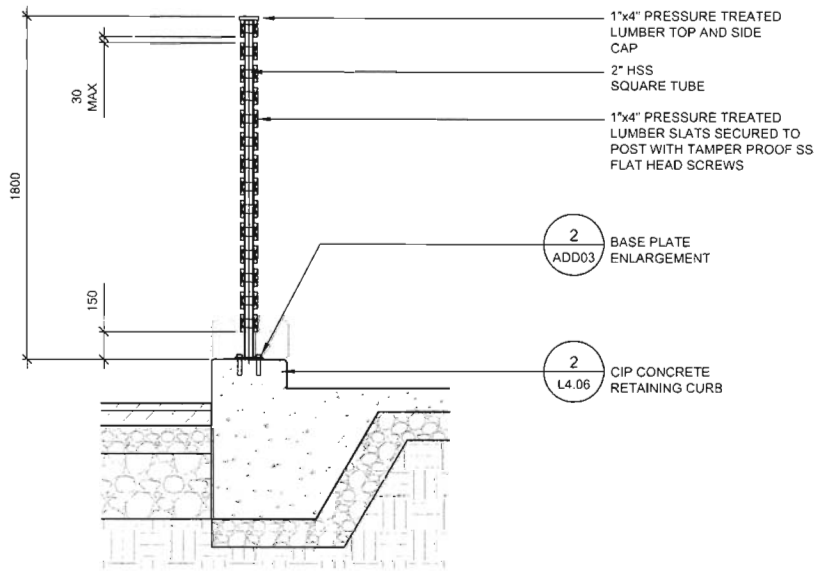
20. "How will the cost of tipping fees be addressed if we run into contaminated soils? Will the city dump wave any fees? In the 526 Bay Street Historic Contamination soil sampling program it states that "Some strong odours were noted in the final soil samples on the south and east walls, aswell as the floor samples collected between the bedrock crevasses. The excavation was not permitted to extend beyond the edge of sidewalk on the south (sample S-6) and east (sample S-1) walls of the excavation and the best attempt was made at digging any loose bedrock and soils from the bottom of the excavation to the solid bedrock surface (sample S-21). Measurable BTEX and PHCs (F1-F4) soil concentrations from the remaining final limits of the excavation were below or undetectable compared to the applicable Table 7 Standards except on the south and east walls and the bottom of the exaction in the bedrock crevasses.""
The contaminated soils have been removed from the site as much as possible, however if contaminated soils are discovered on site, all impacted soil to be segregated and disposed of at a site designated to accept contaminated materials at the Awarded Contractor's expense. An existing leachate test has been conducted for 526 Bay Street and 535 Queen Street and no additional testing would be required if the Contractor discovers additional impact soil in these areas. The Owner is able to accept contaminated materials at the landfill from City properties at no cost.

21. "We have two (2) specifications for the roof assembly. One is TPO and the other is PVC. Do you wish both prices on the bid form?"
TPO Roofing is to be included in the base bid. As noted in the 'Alternative Prices Bid Form Supplement', please indicate PVC Roofing in Lieu of TPO.

END OF ADDENDUM

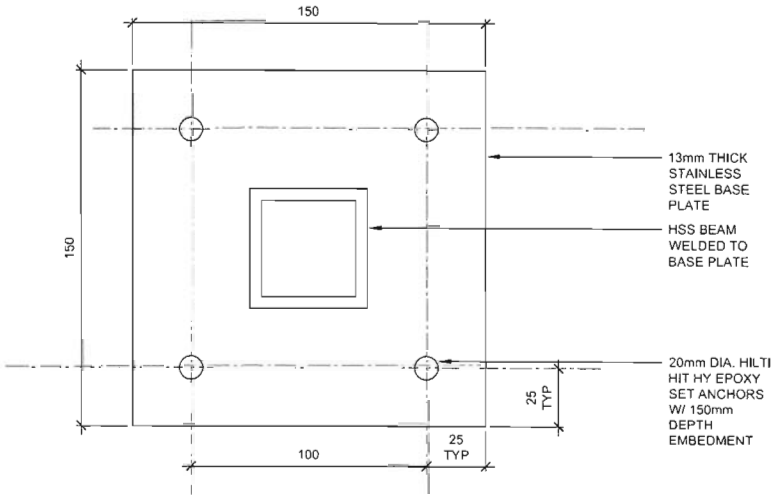

QUEEN ST E
LEGEND
MATERIALS
KEY PLAN
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
MATERIALS AND
FURNISHINGS PLAN A
19-076
TC
LH
2022-03-30
1:150
L2.01


MATCHLINE
MATCHLINE
MATCHLINE
MATCHLINE
BAY ST
LEGEND
MATERIALS
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
MATERIALS AND
FURNISHINGS PLAN B
19-07b
LH
2022-03-30
1:150
L2.02



1 ADD03 WOOD PRIVACY SCREEN

SCALE: 1:25



2 ADD03 WOOD PRIVACY SCREEN BASE PLATE

SCALE: 1:2

SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA

CITY OF SAULT STE. MARIE

BrookMcIlroy

LANDSCAPE DETAILS
WOOD PRIVACY SCREEN

19-076

TC

LH

2022-03-30

AS SHOWN

ADD03

PART 1 GENERAL

1.1 RELATED WORK

.1 Section 31 05 17 – Aggregate Materials
.2 Section 31 32 21 – Geotextiles
.3 Section 32 12 17 – Asphalt Paving
.4 Section 32 13 10 – Unit Paving
.5 Section 32 13 15 – Concrete Walks, Curbs, and Gutters
.6 Section 32 37 00 – Site Furnishings

1.2 REFERENCES

.1 Concrete materials and methods of construction: to current CAN/CSA-A23.1 standards.

.2 Construct work in accordance with applicable current ASTM and ASTI standards.

.3 CAN/ULS S701-05 Thermal Insulation, Polystyrene, Boards

1.3 INSPECTION AND TESTING

.1 Obtain approval from the Consultant and/or Contract Administrator of the concrete bases or subbases before proceeding.

.2 Arrange and pay for all testing of the concrete by an independent testing agency approved by the Consultant and/or Contract Administrator. Submit all test reports of the Consultant and/or Contract Administrator in a timely manner to prevent delays to the Work.

.3 Concrete testing: to current CAN/CSA-A23.2 by testing agency designated and paid for by the City. Accelerated test methods will apply.

.4 Give the testing agency minimum 24h notice before each concrete pour.

.5 Comply with the requirements of Section 01450 - Quality Control and Testing.

.6 Conform to current CSA Standard CAN3-A23.2-M90.

.7 Concrete testing by agency appointed by the City will include:
  .1 A standard strength test for concrete placed but not less that one test for concrete placed each day. Each strength test sample will consist of three cylinders with proper identification and field data. One specimen will be tested at 7 days and 28 days. Cylinders will be field cured prior to shipping to the test laboratory.
  .2 One standard air entrainment test for each standard strength test.
  .3 One or more standard slump test with each standard strength test. The Town may require additional testing for each truck load placed, as deemed necessary.

.8 Concrete may be rejected prior to placement if:
- .1 Concrete fails to conform with the specified mix design.
- .2 The concrete placement does not begin within 2 hours from plant batch time.
- .3 The concrete is older than 2 hours from plant batch time.
- .4 The concrete has undergone less than 70 or more than 100 revolutions at the mixing speed.

.9 Concrete test compressive strength: Concrete will be considered under strength if:
- .1 The average of any day's tests of each class of concrete is below specified strength.
- .2 Any single test falls below 80 percent of the specified strength. In case of dispute, the Contractor may have two 100mm DIA cores from the concrete drilled and tested at their own expense, in accordance with the current CSA Standard CAN3-A23.2-M90. The results shall be applied in the manner outlined above.

.10 Concrete will be considered defective by the Consultant if it is not watertight, shows evidence of honeycombing, is improperly finished or is contrary to the drawings and details and shall be replaced by the Contractor at their own expense.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit engineer stamped shop drawings for all retaining walls, stairs, footings, and reinforced structures.

.3 Submit placing drawings prepared in accordance with plans to clearly show type, size, shape, and location of all concrete joints.

.4 Detail reinforcing steel in accordance with Manual of Standard Practice of Reinforcing Steel Institute of Ontario (RSIO).

.5 Each drawing submitted showing formwork design shall be in accordance with the current CAN/CSA-A23.1, and bearing stamp and signature of professional engineer registered or licensed in province Ontario, Canada.

1.5 QUALITY ASSURANCE

.1 The Contractor must have a minimum 10 years experience in the construction of concrete pavements and landscape concrete features of a similar nature as specified for the project.

.2 Obtain approval from the Consultant and/or Contract Administrator of site layout required for the execution of the work including grade stakes indicating finished elevations on the site, layout of all false work, reinforcing and concrete surfaces.

.3 Any work not meeting the standards of the approved sample or the specifications herein shall be corrected by the Contractor at their own expense.

.4 Do not allow concrete to be contaminated by foreign materials or hardened concrete.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Concrete work materials and measurements to conform to applicable details.

.2 Portland cement: to current CAN/CSA-A5, Type 10.

.3 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa at 28 days.

.4 Reinforcing bars: to current CAN/CSA-G30.18, Grade 400.

.5 Welded steel wire fabric: to current CSA-G30.5

.6 Waterstops: extruded ribbed PVC strips, 12 MPa tensile strength, minimum 350% elongation, minus 45°C to plus 80°C working temperature, sizes as indicated.

.7 Premoulded joint filler: bituminous impregnated fibreboard to current ASTM D 1751.

.8 Joint sealer/filler: colour matched, cold applied, to current CAN/CGSB-19.20, Type 1.

.9 Rink Sealer: proprietary silane water repellant penetrating sealer.

.10 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel, insulation filled.

.11 Non-shrink grout: premixed compound consisting of metallic aggregate, cement, water, reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 45 Mpa at 28 days.

.12 Dry pack: premixed of non premixed composition of non metallic aggregate, cement and sufficient water for the mixture to retain its shape when made into a ball of hand and capable of developing compression strength of 32 Mpa at 28 days.

.13 All other concrete materials: to current CAN/CSA-A23.1.

.14 Insulation:
- .1 100mm High Load-100 Styrofoam (2 layers of 50mm) along CIP concrete island rink wall.

2.1 CONCRETE MIXES

.1 The proportions and qualities of cement, water and aggregate shall conform to the CSA Specifications A23.1-M, latest revision, for "READY MIX CONCRETE".

.2 Concrete shall be supplied from a Ready Mixed Concrete Supplier certified by the "Ready Mixed Concrete Association of Ontario" to the following minimum requirements:

.1 Concrete Mix 01 – for all pathways, curbs, furniture pads, and rink
- .1 Compressive Strength: 32 Mpa in 28 days.
- .2 Cement Content: 335 kg/m³.
- .3 Exposure: Class C2.
- .4 Water/Cement Ratio: 0.45.
- .5 Maximum size of aggregates: 20mm.
- .6 Maximum slump: 80 mm +/-10 mm
- .7 Air Entrainment: 5% to 8%.

.2 Concrete Mix 02 – for all walls and stairs
- .1 Compressive Strength: 35 MPa in 28 days.
- .2 Cement Content: 335 kg/m³.
- .3 Exposure: Class C1.
- .4 Water/Cement Ratio: 0.40.
- .5 Maximum size of aggregates: 10mm.
- .6 Maximum slump: 80 mm +/- 20 mm
- .7 Air Entrainment: 6% to 9%

.3 The City and/or Consultant reserves the right to take whatever corrective action is needed if the concrete fails to meet the requirements of this specification or shows defects after placing. The Contractor shall facilitate any needed investigation or inspection of the work.

2.2 MIX PROPORTIONS

.1 Method: Alternative 1 of current CAN/CSA-A23.1.

.2 Cement type: as specified under 2.1.

.3 Minimum 28 day compressive strengths and exposure classifications:
- .1 Pavements, walks, curbs, rink, and exposed site concrete: 32 MPa; C-2.
- .2 Walls and stairs: 35 MPa; C-1
- .3 All other concrete: 25 MPa; C-4.

.4 Nominal size of coarse aggregate: Clause14 of current CAN/CSA-A23.1.

.5 Slump: to Table 6 of current CAN/CSA-A23.1.

.6 Air content: all concrete to contain purposely entrained air in accordance with Table10 of current CAN/CSA-A23.1.

.7 Admixtures: to Clause 6 of current CAN/CSA-A23.1.

.8 Polypropylene fibres: add 1 kg/m ^{3}, at plant, with minimum 7 minutes mixing time.

PART 3 EXECUTION

3.1 WORKMANSHIP

.1 Obtain City and/or Consultant approval before placing concrete.

.2 Place concrete in accordance with current CAN3-A23.1-M90.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Obtain City and/or Consultant approval of proposed method for protection of concrete during placing and curing in adverse weather, prior to placing of concrete.

.5 Maintain accurate records of cast-in-place concrete items to indicate date, location of pour, air temperature and test samples taken.

3.2 INSTALLATION

.1 Backfilling: Backfill the underside of the curbs, walls, etc. compacted to 98% Standard Proctor Maximum Dry Density, as detailed.

.2 Placing Formwork: design, fabrication, erection and use of concrete formwork shall conform to the current requirements of CSA Standard S269.3.

.3 Forms shall be constructed with temporary ports or openings at the bottom of all deep units such as columns and walls to facilitate cleaning and inspection.

.4 For treated formwork surfaces the materials used as a parting agent shall be non-staining. The amount of material used shall be kept to a minimum and any that adheres to reinforcing steel shall be removed. When the concrete surfaces are to receive a permanent finish coating, the parting agent shall be compatible with the coating.

.5 Prior to placing concrete, a suitable means for checking the alignment and elevations of forms during placing shall be provided. These checks shall be made frequently during the placing of the concrete, and adjustments to the formwork and falsework made as required until all concrete is in place.

.6 Forms where used shall remain in place at least 8 hours after the concrete has been placed against them. Where the air temperature drops below 10°C at any time during the 8 hour period the forms shall be left in place for such additional time as is necessary to prevent damage to the edges. Curing of the exposed concrete shall begin immediately upon removal of the forms.

.7 Refrigerated concrete rink to be placed in one continuous pour with no saw-cut joints/ control joints in slab.

.8 Placing Joints: Crack-control joints shall be cut within 24 hours using power-driven abrasive or diamond blades. Cutting of joints shall begin as soon as the cut is made and before shrinkage cracks form in the concrete.

.1 The depth of the control joints shall be between a quarter and a third of the thickness of the slab or wall.

.2 Control of construction joints to the surface plane, as shown on drawings.

.3 Maximum interval not to exceed 2 metres.

.4 Placing Expansion Joint: material should be placed to full depth to isolate any rigid structure encountered in the line of the work, and place expansion joints to the full depth of the concrete curb at a maximum of 6 metres spacing.

.9 Placing Concrete: All concrete shall be placed under the following conditions:

.1 Each load shall have correct air content.

.2 Slump tests shall be taken on the first load of concrete arriving on the job site, and thereafter at the discretion of the City and/ or Consultant.

.3 In dry forms accepted by the Testing Agency.

.4 As near as possible to its final position.

.5 Maximum vertical drop from chutes shall be 1.5m.

.6 Evenly on both sides of the expansion joints so as to retain their vertical position.

.7 Forms shall be filled with an excess of concrete thoroughly spaded, compacted and struck off to its required level in such a manner as to force the coarse aggregate below the surface of the mortar.

.8 Air temperature shall be 5°C and rising, and all necessary precautions shall be taken during cold weather.

.9 No concrete shall be placed on frozen ground.

.10 Concrete shall have a temperature of no less than 10°C and no more than 38°C at the time of the placing, and means acceptable to the Testing Agency shall be provided to maintain these limits for 72 hours after placing.

.11 Concrete shall be continuously vibrated (formwork or internal) during placement to eliminate all air pockets and ensure sufficient coverage throughout formwork.

.10 Concrete Finishing and Form Stripping: The formwork may be stripped after initial set of the concrete has been achieved.

.11 On exposed formed surfaces, neatly chip off fins, unsightly ridges or other imperfections; fill small surface voids with grout and rub flush with the general surfaces.

.12 Rub exposed sharp edges of concrete with Carborundum to produce 3mm radiused edges unless otherwise detailed.

.13 Slope surfaces as indicated on plan.

3.3 INSERTS

.1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100mm x 100mm not indicated, must be approved by the City and/or Consultant.

3.4 CURING

.1 Concrete surfaces shall be cured for 3 days at a minimum temperature of 10ºC or for the time necessary to attain 35% of the specified 28 day compressive strength of the concrete.

.2 Concrete shall be cured by the installation of a curing compound of polyethylene vapour barrier ensuring complete coverage of the concrete.

3.5 COLD WEATHER WORK

.1 Take cold weather precautions whenever the ambient temperature is, or is expected to be, at or below 5 ºC.

.2 Have protective measures in place, or adjacent to the work before any concrete is mixed or ordered.

.3 Maintain concrete temperature between 10ºC and 20ºC for a minimum of 3 days for unloaded areas, and 6 days for areas receiving partial load. These durations may be reduced by 33% with the use of high early strength cement.

.4 In methods employed to maintain the concrete temperature, provide suitable access for inspection.

3.6 FINISHES

.1 All exposed vertical surfaces of concrete to be architectural grade with a totally smooth, free of air pockets, stains, roughness, chipped corners, etc.

.2 Pavements, walks, walls, curbs, rink, and exposed site concrete: screed to plane surfaces and float using aluminum, magnesium, or wood floats. Round edges and provide joint spacings using standard tools. Trowel smooth followed by sandblast non-slip finish.

- .1 Surfaces shall be blasted using abrasive achieving an even and uniform exposure of aggregate.
- .2 Sandblasted surfaces shall have uniform depth of cut-back, distribution of aggregate and colour and texture matching the sample accepted by the Consultant.
- .3 Individual concrete members shall be sandblasted at the same age to ensure reasonable colour uniformity.

.3 Municipal Sidewalk: Match existing sidewalk condition as per City Standard.

3.7 CONTROL JOINTS

.1 Cut or form control joints in slabs on grade at locations indicated, in accordance with current CAN/CSA-A23.1. Fill with specified joint sealer/filler.

3.8 EXPANSION AND ISOLATION JOINTS

.1 Install pre-moulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.

.2 Caulk joints as indicated on drawings.

.3 Watertight joint surrounding rink:
- .1 Product: DSM System Joint
- .2 Supplier: Emseal Joint System Ltd. (or approved equal)

.4 Rink Wall Joint Sealant: two-component polysulphide sealant applied according to manufacturer's instructions.
- .1 Deck-O-Seal by WR Meadows
- .2 Primer – as recommended by sealant manufacturer
- .3 Bond breaker – as recommended by sealant manufacturer

3.9 CURING

.1 Cure and protect concrete in accordance with current CAN/CSA-A23.1, except that curing compounds shall not be used where bond is required by subsequent topping or coating.

3.10 GROUT

.1 Grout voids under baseplates.

.2 Grout into place, bolts and other items of concrete hardware, that are not placed prior to pouring concrete.

.3 Mix and place grout.

3.11 SEALING

.1 Following curing, apply silane water repellant penetrating sealer treatment to exposed surfaces.

.2 Apply silane penetrating sealer per manufacturer's instructions.

.3 Rink Slab:
- .1 Pentreat 244-40 WB by WR Meadows, Inc. (800) 342-5976 (or approved equal)

END OF SECTION

GEOTECHNICAL REPORT

Sault Ste. Marie Downtown Civic Plaza Development

Sault Ste. Marie, Ontario

March 2022

TULLOCH Project # 19-1866

2022-03-01	0	Issued for Use	Erik Giles	Josh Lelievre	Sarah deBortoli
2020-02-05	A	DRAFT	Usman Khan	Mrinmoy Kanungo	Sarah deBortoli
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**
	TULLOCH				

TULLOCH

19-1866
March 2, 2022

Attention: Trish Clarke | Associate | Brook McIlroy

RE: Geotechnical Investigation for the Downtown Civic Plaza in Sault Ste. Marie, ON.

Dear Ms. Clarke:

Please find enclosed our Geotechnical Report for the proposed Civic Plaza in the city of Sault Ste. Marie, ON.

This report outlines the results of the geotechnical investigations, and it provides geotechnical recommendations for various aspects of the project. The fieldwork was completed on December 10, 2019. The laboratory testing was completed on January 28, 2019. This report presents the data collected in the field, laboratory test data, design, and construction recommendations.

We trust the enclosed is adequate for your current needs. If there is anything further that we can assist with, please contact us at your convenience.

Sincerely,

Erik Giles
Geotechnical Engineer
TULLOCH Engineering Inc.

TABLE OF CONTENTS

1. INTRODUCTION AND SCOPE 1
2. REGIONAL GEOLOGY and SITE INFORMATION 1
3. SITE INVESTIGATION AND METHODOLOGY 1
4. LABORATORY TESTING PROGRAM 3
5. SUBSURFACE CONDITIONS 3
   5.1 General 3
      5.1.1 Sand and Gravel Fill 3
      5.1.2 Sandy Silt 4
      5.1.3 Silty Sand 4
      5.1.4 Sandy Gravel/Weathered Bedrock Zone 4
      5.1.5 Bedrock 4
   5.2 Groundwater Conditions 5
6. GEOTECHNICAL RECOMMENDATIONS 5
   6.1 General 5
   6.2 Foundation Design 5
      6.2.1 Foundations on Bedrock 6
      6.2.2 Foundations on Soil 7
   6.3 Access Roads and Parking Lot 7
   6.4 Open Cut Excavations and Groundwater Control 9
   6.5 Pipe Bedding and Backfill 9
   6.6 Frost Protection 10
   6.7 Dewatering During Construction 10
   6.8 Site Classification for Seismic Response 11
   6.9 Soil Corrosivity 11
7. CLOSURE 12

LIST OF TABLES

Table 3-1: Summary of Borehole Information 2
Table 4-1: Summary of Soil Laboratory Testing Program 3
Table 5-1: Depth to Bedrock 5
Table 6-1: Bearing Capacity for Foundations on Rock 6
Table 6-2: Bearing Capacity for Foundation on Silty Gravelly Sand 7
Table 6-3: Recommended Pavement Structure 8
Table 6-4: Soil Corrosivity Results 11

LIST OF APPENDICES

APPENDIX A – KEY AND SITE LOCATION PLAN AND FIGURES
APPENDIX B – ABBREVIATIONS, TERMINOLOGY, AND PRINCIPAL SYMBOLS USED
APPENDIX C – BOREHOLE LOGS
APPENDIX D – LABORATORY RESULTS
APPENDIX E – NOTICE TO READER

1. INTRODUCTION AND SCOPE

TULLOCH Engineering Inc. (TULLOCH) was retained by the City of Sault Ste. Marie to complete a geotechnical site investigation for the proposed development of a new Civic Plaza in the Downtown area of the City of Sault Ste. Marie, Ontario. The proposed plaza will be located in the central Downtown area. The scope includes repurposing an existing civic parking lot, and transforming the area into a multi-purpose, multi-season public space.

A key location plan and a site plan showing the borehole locations can be seen in Appendix A. A total of eight (8) borehole locations were selected across the site for representative sampling and testing; seven (7) on Bingham parking lot and one (1) on Queen St. Inferred bedrock was encountered in all the drilling locations due to auger/sampler refusal at all borehole locations. The purpose of the geotechnical investigation was to evaluate the subsurface conditions for the proposed development.

This report provides the factual geotechnical investigation data and geotechnical design recommendations, which are based on the site investigation data, our understanding of the project scope and engineering experience.

2. REGIONAL GEOLOGY AND SITE INFORMATION

The project site is situated on glaciolacustrine lake plain deposits found in lowland areas adjacent to Lake Superior and the St. Mary's River. The surficial geology indicates silty and clayey sediments in a lacustrine plain landform. Relief is low, topography is planar, and surface drainage conditions are dry. The bedrock is expected to be shallow at the southern part of the city.

The underlying bedrock at the project site belongs to the Proterozoic Mesoproterozoic era. The bedrock is described as Jacobsville Group, Oronto Group; a thick formation sequence of predominantly red sandstones with some conglomerates which occur on the eastern and southern shores of Lake Superior.

3. SITE INVESTIGATION AND METHODOLOGY

The geotechnical investigation was completed on December 10th, 2019. The borehole investigation consisted of advancing eight (8) boreholes throughout the site, referenced as BH-01 to BH-08. The boreholes were advanced from ground surface to depths of approximately 0.8 m to 3.3 m. Boreholes were terminated upon refusal on the inferred bedrock surface. A

summary of the investigation is shown below in Table 3-1: Summary of Borehole Information. Borehole layout and coordinates can be viewed in Appendix A.

Table 3-1: Summary of Borehole Information

Borehole No.	Easting (m)	Northing (m)	Depth (mbgs)
BH-01	350663	5116399	2.3
BH-02	704793	5154119	3.3
BH-03	704767	5154088	2.6
BH-04	704748	5154079	0.8
BH-05	704742	5154115	0.8
BH-06	704718	5154113	1.1
BH-07	704722	5154099	0.9
BH-08	704783	5154117	3.6

Boreholes were advanced using a Geoprobe 7822DT drill rig that was owned and operated by North Drilling based in Sault. Ste Marie, Ontario. Borehole advancement was conducted with 200 mm OD diameter, continuous flight, hollow stem augers. The rig was equipped with standard split spoon soil sampling equipment.

In the overburden, soil samples were obtained with standard split spoon equipment in conjunction with Standard Penetration Tests (SPT) conducted following ASTM D1586 procedures. SPT "N" blow count values were generally measured at 0.75 m intervals in the upper 3.0 m of the borehole and at 1.5 m intervals thereafter.

The soil sampling program was directed by a TULLOCH representative, who logged the drilling operations and identified the soil samples as they were retrieved. The recovered soil samples were transported to TULLOCH's CCIL Certified Laboratory in Sault Ste. Marie for detailed examination and testing. All samples will be stored at the laboratory for three (3) months and then disposed of unless directed otherwise. Typical terminology, symbols and abbreviations used in this report can be found in Appendix B or otherwise noted in table notes and detailed borehole logs can be found in Appendix C.

4. LABORATORY TESTING PROGRAM

A geotechnical laboratory testing program was undertaken on representative samples taken from the boreholes and conducted in accordance with ASTM standards. Table 4-1 provides a list of the testing program. Detailed laboratory reports can be found in Appendix D. Corrosivity testing was conducted on BH-08 bagged sample no. 5.

Table 4-1: Summary of Soil Laboratory Testing Program

Test	Number of Tests	Standards
Sieve Analysis	4	ASTM D422
Moisture Content	26	ASTM D2216
Corrosivity Testing	1	Various

5. SUBSURFACE CONDITIONS

5.1 General

The project site typically consisted of parking lot pavement structures of approximately 80 mm of asphalt overlying a sand and gravel fill to a depth of approximately 0.8 m. All boreholes were terminated before the target depth of 10 m due to the presence of inferred shallow bedrock. Subsurface conditions encountered at the project site are summarized below as they were encountered from ground surface. Detailed borehole logs and laboratory testing summaries can be seen in Appendix C and D respectively. It should be noted that the soil and rock boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. Each soil layer will be discussed in the sequence it was encountered from ground surface.

5.1.1 ASPHALT

A layer of existing asphalt was encountered across all boreholes at ground surface and was typically found to be approximately 80 mm in thickness.

5.1.2 Existing Sand and Gravel Fill

An existing Sand and gravel fill was encountered beneath the asphaltic pavement layer in all the boreholes except in BH-04. The sand and gravel fill was likely placed as a road base material during construction of the parking lots on site. The fill typically extended to a depth of approximately 0.8 m. Fill material extended to a depth of approximately 1.5 mbgs in BH-03 and BH-05. Generally, this layer was augured using a solid stem auger. Standard penetration tests

(SPT) were generally not conducted within this fill layer due to the frozen ground conditions. Based on a single SPT blow count of 28 observed in BH-02, the relative material density appeared to be compact. The average water content in the fill was found to be 6%.

5.1.3 (ML) - Sandy SILT

The sandy silt was encountered below the fill in BH-01, -02, and -08 at the project site. The material was light brown to brown in color. The material was observed to have a non-cohesive behaviour based on observations by the TULLOCH site representative. This layer is characterised by variable moisture contents ranging between 3 and 30% and SPT blow counts ranging between 1 and 14 blows per 30 cm of sampler advancement. The relative density typically ranges from very loose to compact.

5.1.4 (SM) – SILTY SAND

A reddish-brown silty sand deposit was encountered in BH-03, -04 and -08 is reddish in color. The material typically was found to overly the weathered bedrock and or sandy gravel stratum. The SPT tests indicate relative density ranging from loose to dense with SPT blow ranging from 5 to 31 blows per 30 cm of sampler advancement. The moisture content is typically below 15%.

5.1.5 (GW) Sandy GRAVEL/ Possible Weathered Bedrock Zone

A transitional zone from soil to weathered bedrock was encountered ranging from 0.3 m to 0.6 m in thickness overlying the more competent bedrock upon which auger refusal was encountered. The samples collected in the weathered zone consisted of sandy gravel with trace to some fines. Occasional rock fragments were observed within the retrieved split spoon samples. The relative density ranges from dense to very dense.

5.1.6 Inferred Bedrock

Coring of bedrock was outside of the scope of this investigation; therefore, no information is available on the bedrock condition. Table 5-1 summarizes depth to bedrock inferred based on the refusal of the hollow stem augurs during the investigation. Refusal was encountered at all boring locations as outlined in the table below.

Table 5-1: Depth to Inferred Bedrock

Borehole	Inferred Bedrock Depth (mbgs)
BH-01	2.9
BH-02	3.3
BH-03	2.6
BH-04	0.9
BH-05	1.4
BH-06	1.1
BH-07	0.9
BH-08	3.6

5.2 Groundwater Conditions

Groundwater was not encountered during the drilling investigation. A review of the Ministry of Environment Conservation and Parks (MECP) well logs in the area indicates groundwater is expected at a depth ranging from 1.0 m to 3.0 m depending on the time of the year. The groundwater level will fluctuate throughout the year with higher ground water level during the wet seasons (Spring and Fall) and lower levels during the dry seasons (Summer and Winter). The groundwater level should be confirmed prior to the start of construction. Due to the presence of a shallow inferred bedrock surface, there is also the possibility of encountering perched ground water between the soil/rock interface.

6. GEOTECHNICAL RECOMMENDATIONS

6.1 General

The purpose of the following subsections is to provide geotechnical recommendations for the development of the Downtown Plaza. In our understanding, the civil works will include underground utilities such as water, sanitary and storm lines. We understand that lightly loaded structures such as restrooms, a stage and vendor stalls are also planned.

6.2 Foundation Design

Based on the results of the geotechnical investigation, the depth to bedrock varies between 0.9 m and 3.3 m at the project site. Based on the Ontario Provincial Standard Drawing 3090.100 "Foundation Frost Depths for Northern Ontario", the design frost depth can be taken as 1.8 m for Sault Ste. Marie, although the actual frost penetration depth will depend on the air freezing index

for the season, the type of backfill soils and snow cover. A geotechnical engineer must be retained to supervise the subgrade preparation and approve subgrade for placement of the foundation. The following sections will outline potential feasible foundation and their subsequent geotechnical recommendations.

6.2.1 Foundations on Bedrock

Foundations placed directly on the competent bedrock surface are feasible for this site. Prior to placing concrete on the bedrock, any weathered, fragmented or loose rock must be removed to expose fresh rock with a rock mass quality of fair to good. After excavating to the design foundation level, the exposed bedrock should be thoroughly cleaned, and pressure washed to ensure the rock surface is free of dirt, debris, standing water, snow or other deleterious materials, and a lean concrete mud mat should be placed on the rock to protect it during foundation construction. Where such removals result in local over excavation, the over excavated zone should be backfilled with lean concrete (5 MPa).

In some cases, foundations may be constructed on an OPSS 1010 Granular A fill pad placed directly on the prepared bedrock. Where required, the Granular A fill should be placed in 300 mm thick lifts and compacted to 100% of the Standard Proctor Dry Density (ASTM D698) to achieve a dense bearing material of uniform thickness. Generally, competent bedrock is not susceptible to frost heave; however, insulation may be considered above the foundation and surrounding the building for heated structures to reduce thermal bridging through the bedrock and backfill material, and lower future energy costs.

Table 6-1: Bearing Capacity for Foundations on Rock

Bearing Capacity Parameter	Resistance (kPa)
Factored ULS – Foundation on Bedrock	500
SLS – Foundation on Bedrock	Does not govern
Factored ULS Foundation on Engineered Fill Pad over Competent Bedrock	250
SLS – Foundation on Engineered Fill Pad over Competent Bedrock (assuming 25 mm of total settlement)	150

For areas where the bedrock is deeper, short concrete piers within sonotube formwork may be considered. The contractor must ensure that this extends beyond the weathered rock and socket into intact bedrock to ensure that full bearing capacity of the sandstone bedrock can be utilized. If this is the case TULLOCH should be contacted for additional input. Furthermore, TULLOCH

may be contacted to provide guidance if other types of deep foundations are considered, such as helical piles or H-Piles.

6.2.2 Foundations on Soil

For areas with bedrock below the frost penetration depth, the foundation may be constructed on the Sandy Gravel material at a depth below 2.2 m to extend below the loose sandy silt layer and provide adequate frost cover. It should also be feasible to found lightly loaded structures at the frost penetration depth of 1.8 m in the Sandy Silt layer. Table 6-2 below outlines bearing capacities of shallow foundations at 2.2 m and 1.8 m deep.

Table 6-2: Bearing Capacity for Foundation on Silty Gravelly Sand

Strength Parameter	Resistance (kPa)
Factored ULS – Foundation on Sandy Gravel at 2.2 m	200
SLS – Foundation on Sandy Gravel at 2.2 m	130
Factored ULS – Foundation on Sandy Silt at 1.8 m	90
SLS – Foundation on Sandy Silt at 1.8 m	60

Note(s): SLS values are based on an allowable settlement of 25 mm.

For slab-on-grade structures, the slab-on-grade should be placed on a 150 mm thick bedding layer comprising Granular A material compacted to 100% of the Standard Proctor Maximum Dry Density (SPMDD). The slab-on-grade should comprise cast-in-place concrete cast on a vapor barrier on the Granular A bedding. All topsoil should be removed prior to the placement of bedding material. If the subgrade is observed to have a high fines content, non-woven geotextile with a weight per unit area of 140 g/cm^2 or higher should be placed below the Granular A fill on the native subgrade soils. A modulus of subgrade reaction of 20 MPa/m is recommended for the slab-on-grade design.

Considering the frost susceptibility of the on-site soils, frost tapers should be incorporated in the foundation backfill zone if soils of different frost susceptibility are used, as well as at the termination point of foundation insulation materials should they be used.

6.3 Access Roads and Parking Lot

Detailed traffic loads have not been determined at this stage of the project. Table 6-3 provides a typical pavement structure recommended for the project site. The recommended pavement structure assumes good drainage of the subgrade soils and the pavement structure. Alternative

designs may be considered depending on the availability of imported fill. TULLOCH should be retained to provide guidance and approval.

Table 6-3: Recommended Pavement Structure

Pavement Layer	Light Duty (Cars) Thickness, mm	Heavy Duty (Trucks) Thickness, mm
Asphalt surface course: HL 3 or SP 12.5	40	40
Asphalt base course: HL 8 or SP 19.0	40	80
Base: Granular A	150	150
Sub-Base: Granular B	300	450

The recommended pavement structure is typical for a design life of up to 10 years before the first major rehabilitation (i.e., resurfacing) is required. Regular maintenance (i.e., crack treatment and pothole patching) of the pavement will be required as needed during the design life. The long-term performance of the pavement is highly dependent on the drainage conditions of the base, sub-base and subgrade. The catch-basins should be drained into low spots and away from the building and parking lot areas. Radial subdrains should extend 3 m from the catch basins to ensure proper drainage of the pavement structure. The subgrade and finished pavement surface should be graded to ensure proper drainage.

If the frost susceptibility of backfill materials for utility trenches or foundation excavation differ from that of the surrounding native soils, a minimum frost taper of 3 horizontal to 1 vertical should be incorporated into the subgrade as a transition between different pavement subgrade conditions to minimize differential frost heaving. It is recommended that the lateral extent of the subbase and base layers not be terminated vertically behind curb lines. A subgrade frost taper with a minimum 3 horizontal to 1 vertical is recommended to minimize differential frost heaving potential under curbs and sidewalks.

All access roadways and parking lots areas should be stripped of topsoil and other deleterious materials to expose the underlying sand and gravel Fill or undisturbed native soils. The subgrade should be proof-rolled using a fully loaded 20 Ton tandem axle dump truck prior to placement of the sub-base. Additional compaction or replacement of the subgrade with Granular B may be required if excessive deflections or deformations were observed during the proof-rolling. If local zones of wet, weak, or compressible material of limited depth and extent are encountered, then the material should be removed, and the excavation backfilled with Granular B.

The sub-base (Granular B) and base (Granular A) should be compacted to 98% and 100% respectively, of the SPMDD. A material testing consultant should be retained to ensure compaction by Nuclear Methods (ASTM D6938) or Sand-Cone Method (ASTM D1556). A proctor test should be completed every 500 cubic meters of the fill used to calibrate the maximum dry density for the compaction test equipment.

6.4 Open Cut Excavations and Groundwater Control

If workers are required to enter excavations deeper than 1.2 m, the trench excavations should be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act (OHSA), Ontario Regulation 213/9, Construction Projects, January 1, 2010, Par III – Excavations, Section 226. If maintaining a slope is not feasible due to tight construction space, excavation walls should be supported by engineered shoring system, bracing, or trench boxes complying with sections 235 to 239 and 241 under 0. Reg. 231/91, s. 234(1).

Based on the OHSA, the in-situ soils are classified as Type 3 above the groundwater table and Type 4 below the groundwater table. The very loose layers within the sandy silt deposit may behave as a Type 4 soil even above the groundwater level.

Temporary excavation side slopes in Type 3 soils should remain stable at a slope of 1H:1V commencing at the base of the excavation. Temporary excavation side slopes in Type 4 soils should remain stable at a slope of 3H:1V.

Surface water should be prevented from entering the excavation. The in-situ soils can be excavated using conventional earthmoving equipment. In addition to compliance with the OHSA, the excavation procedures must also comply to other regulatory authorities, such as federal and municipal safety standards.

The bedrock is expected to be shallow (up to 0.9 m deep) at some parts of the project site per BH-04, BH-05, BH-06 and BH-07. The contractor should be able to excavate the weathered bedrock using an appropriately sized excavator with a toothed bucket. Allowance should be made for an excavator breaker attachment to break rock in case the underground utility installation requires breaking of the weathered rock to ensure adequate frost cover above the utilities. Deeper bedrock excavations may require additional effort and/or blasting.

6.5 Pipe Bedding and Backfill

Bedding for utilities should be placed as per the pipe design. It is recommended to place a minimum of 150 mm to 200 mm OPSS Granular A below the pipe invert as bedding material. A

minimum 300 mm cover should be placed along the sides and above the crown of the pipe. The backfill can be OPSS Granular A compacted to minimum 95% SPMDD with a maximum lift thickness of 300 mm. However, frost tapers need to be incorporated in the backfill zone if imported/non-native soils are used as backfill, as discussed above.

The native soils at the site are not a suitable bedding for service pipes. It may be challenging to achieve the compaction specifications if there is ground water seepage into the excavation. If this occurs, an alternative of 19 mm clear stone wrapped in geotextile may be used for pipe bedding to minimize compaction effort. Proper overlap of the geotextile is required to prevent migration of fines into the 19 mm clear stone bedding.

6.6 Frost Protection

In the Sault Ste. Marie area, the frost penetration depth is 1.8 m per OPSD 3090.100. Accordingly, the minimum soil cover for foundations or utility services is 1.8 m. The frost line may be raised by use of thermal insulation. Typically, 25 mm of insulation with a width equivalent to the depth of cover will raise the frost line by 0.3 m. TULLOCH should be contacted to confirm this assumption, if a product is selected for insulating the underground utilities and/or foundations

6.7 Dewatering During Construction

The native material comprises sandy silt, silty sand, and sandy gravel. The soil is expected to generally have a high permeability. As discussed previously, groundwater was not encountered during our investigation. However, considering the nearby MECP well logs, the type of soils at the site and the potential for seasonal groundwater level fluctuation, groundwater may still be encountered during construction. Perched ground water table may also be present due to the shallow bedrock surface.

Excavation below the water table is generally not recommended due to the advanced dewatering required to enable construction. If excavation is to extend below the groundwater table, pro-active dewatering techniques such as well points or groundwater cut-off measures such as sheet piling would be required. Conventional sump and pump techniques will not be enough to control groundwater seepage into open excavations during construction if excavation extends more than 1 m below the groundwater table. Alternatively, the construction work may be scheduled when the water table is below the depth of excavation required to complete the work.

6.8 Site Classification for Seismic Response

The 2015 National Building Code of Canada (NBCC) stipulates the methodology for earthquake design analysis. The determination of the type of analysis is predicated on the importance of the structure, the spectral response acceleration, and the site classification for seismic site response.

The parameters for determination of Site Classification for Seismic Site Response are set out in the 2015 NBCC. The site classification is based on the average shear wave velocity in the top 30 metres of the site stratigraphy. If the average shear wave velocity is not known, the site class can be estimated from energy corrected Standard Penetration Resistance (N60) and/or the average undrained shear strength of the soil in the top 30 metres. Given that the foundations are anticipated to be founded on bedrock, based on the 2015 NBCC, this site has been classified as Class B for foundations placed on exposed competent bedrock. These seismic design parameters should be reviewed in detail by the structural engineer and incorporated into the design as required by 2015 NBCC. For foundations on or above the very loose Sandy Silt layer, the site has been classified as Class E based on the N60 value of below 15 in BH-01, BH-02 and BH-08.

6.9 Soil Corrosivity

Representative testing was completed for soil corrosivity and sulphate concentrations at the site. The results of the testing are shown below in Table 6-4-. Samples were tested by TESTMARK Laboratories based in Garson, Ontario. The detailed results can be found in Appendix D.

Table 6-4: Soil Corrosivity Results

Borehole No./Sample No.	Depth (m)	Resistivity (Ω cm)	pH	Redox Potential (mV)	Chloride (µg/g)	Sulfide (%)	Sulphate (µg/g)
BH-08 SS5	3.3	5860	7.5	227	47.1	<5	14

The results of the chemical testing were assessed in reference to the AWWA C-105 Standard from ANSI/AWWA Corrosivity Rating System. A score greater than 10 indicates the requirement of corrosion protective measures for buried cast iron alloys. The tested samples for BH-08 scored 4.5.

In addition, chloride ions can lead to corrosion of steel. Typically, soils with chloride concentrations greater than 500 µg/g are considered corrosive. As noted in the table, chloride concentrations are less than 500 µg/g.

If corrosion protection is required in design, a corrosion specialist should be consulted, and the above results and recommendations should be provided to the specialist for his review.

The concentration of sulphate indicates the degree of sulphate attack for concrete buried at the site. As shown in the table, the sulphate concentrations are less than 1000 µg/g indicating a low degree of sulphate attack. Type GU Portland Cement should be suitable for use at this site.

7. CLOSURE

This geotechnical report has been prepared by TULLOCH for the exclusive use of Brook McIlroy and their authorized agents for the proposed City Plaza development in Sault Ste. Marie, Ontario. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering, for the above noted location. Classification and identification of soils, and geologic units have been based upon commonly accepted methods employed in professional geotechnical practice. No warranty or other conditions, expressed or implied, should be understood. Please refer to Appendix E, Notice to Reader, which pertains to this report.

We trust that the information in this report will be sufficient to allow Brook McIlroy to proceed with the Downtown Plaza Development in Sault Ste. Marie, ON. Should further elaboration be required for any portion of this project, we would be pleased to assist.

Erik Giles P. Eng.
Geotechnical Engineer

REFERENCES

Das, Braja M. Princpals of Foudnation Engineering (Ninth Edition). Cengage, 2017

National Building Code of Canada, NRC, 2015.

Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release---Data 126-Revision 1.

Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV

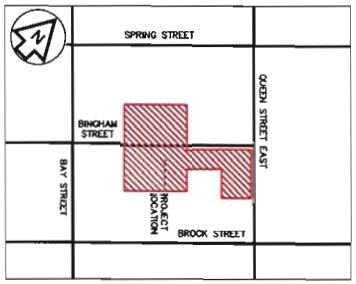
Occupational Health and Safety Act (OHSA), Ontario Regulation 213/9, Construction Projects, January 1, 2010, Part III - Excavations, Section 226.

Canadian Geotechnical Foundation Engineering Design Manual, 2006.

APPENDIX A

KEY AND SITE LOCATION PLAN AND FIGURES

PLAN
SCALE: 1:500



PROJECT LOCATION
N.T.S

BOREHOLE COORDINATES

NAME	EASTING	NORTHING	ELEVATION
19-1866-BH-01	704 802	5 154 104	182.7
19-1866-BH-02	704 793	5 154 119	182.7
19-1866-BH-03	704 767	5 154 088	182.3
19-1866-BH-04	704 748	5 154 079	181.7
19-1866-BH-05	704 742	5 154 115	182.1
19-1866-BH-06	704 718	5 151 113	181.9
19-1866-BH-07	704 722	5 154 099	181.3
19-1866-BH-08	704 783	5 154 117	182.7

LEGEND

BOREHOLE LOCATION

NOTES:

1. CO-ORDINATES ARE IN UTM ZONE 16 (NAD83 CSRS).

0 5 10 15 20 25m
Scale: 1:500

No.	DATE	BY	ISSUES / REVISIONS
0	2020-01-30	KK	ISSUED FOR USE

TULLOCH ENGINEERING

DRAWING: GEOTECHNICAL INVESTIGATIONS
BOREHOLE LOCATIONS
PLAN

PROJECT:
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE

DRAWN BY:	CHECKED BY:	PROJECT No.:
K. KORTEKAAS	U. KHAN	19-1866
DESIGNED BY:	APPROVED BY:	DRAWING No. / REVISION No.
-	U.KHAN	C-01 / 0
SCALE:	DATE:	
AS NOTED	2020-01-30	

APPENDIX B

ABBREVIATIONS, TERMINOLOGY, AND PRINCIPAL SYMBOLS USED

ABBREVIATIONS, TERMINOLOGY AND PRINCIPAL SYMBOLS USED IN REPORT AND BOREHOLE LOGS

BOREHOLES AND TEST PIT LOGS

Soils

AA	Auger Sample	w	Water Content
SS	Split Spoon	wP	Plastic Limit
TO	Tin-walled Tube	wL	Liquid Limit
TP	Thin-walled Piston	V(FV)	Field Vane
WS	Washed Sample	OR	Organic Content
SC	Soil Core	GR	Gravel
BS	Block Sample	SA	Sand
WH	Weight of rods & hammer	SI	Silt
WR	Weight of rods	CL	Clay

Bedrock

TCR	Total Core Recover	VN	Vein
SCR	Solid Core Recovery	CO	Contact
FI	Fracture frequency index	KV	Karstic void
HQ	Rock Core (63.5 mm dia.)	MB	Mechanical Break
NQ	Rock Core (47.6 mm dia.)	PL	Planar
BQ	Rock Core (36.5 mm dia.)	CU	Curved
JN	Joint	UN	Undulating
FLT	Fault	IR	Irregular
SH	Shear	SM	Smooth
K	Slikensided	SR	Slightly Rough
BD	Bedding	R	Rough
FO	Foliation	VR	Very rough

IN SITU SOIL TESTING

Standard Penetration Test (SPT) "N" value. The number of blows required to drive a 51 mm OD split barrel sampler into the soil a distance of 300 mm with a 63.5kg weight free falling a distance of 760 mm after an initial penetration of 150 mm has been achieved.

Dynamic Cone Penetration Test (DCPT) is the number of blows required to drive a cone with a 60 degree apex attached to "A" size drill rods continuously into the soil for each 300 mm penetration with a 63.5 kg weight free falling a distance of 760 mm.

Cone Penetration Test (CPT) is an electronic cone point with a 10 cm base area with a 60 degree apex pushed through the soil at a penetration rate of 2cm/s.

Field Vane Test (FVT) consists of a vane blade, a set of rods and torque measuring apparatus used to determine the undrained shear strength of cohesive soils.

SOIL DESCRIPTIONS

The soil descriptions and classifications are based on an expanded Unified Soil Classification System (USCS). The USCS classifies soils on the basis of engineering properties. The system divides soils into three major categories; coarse grained, fine grained and highly organic soils. The soil is then subdivided based on either gradation or plasticity characteristics. The classification excludes particles larger than 75 mm. To aid in quantifying material amounts by weight within the respective grain size fractions the following terms have been included to expand the USCS:

Soil Classification	
Clay	<0.002 mm
Silt	0.002 to 0.06 mm
Sand	0.075 to 4.75 mm
Gravel	4.751o 75 mm
Cobbles	75 to 200 mm
Boulders	>200 mm

Terminology	Proportion
"trace", sand, etc.	1%to 10%
"some"	10% to 20%
Sandy, Gravelly, etc.	20% to 35%
"and"	>35%
Ex., SAND, SILT, etc.	>35%

Notes:

1. Soil properties, such as strength, gradation, plasticity, structure, etc., dictate the soils engineering behaviour over the grain size fractions;
2. With the exception of soil samples tested for grain size distribution or plasticity, all soil samples have been classified based on visual and tactile observations and is therefore an approximate description.

The following table outlines the qualitative terms used to describe the relative density condition of cohesionless soil:

Cohesionless Soils

Compactness	SPT "N" Value (blows/30cm)
Very Loose	0 to 4
Loose	5 to 10
Compact	11 to 30
Dense	31 to 50
Very Dense	>50

The following table outlines the qualitative terms used to describe the consistency of cohesive soils related to undrained shear strength and SPT, N-Index:

Cohesive Soils

Consistency	Undrained Shear Strength (kPa)	SPT "N" Value (blows/30 cm)
Very Soft	<12.5	< 2
Soft	12.5 to 25	2 to 4
Firm	25 to 50	5 to 8
Stiff	50 to 100	9 to 15
Very Stiff	100 to 200	16 to 30
Hard	> 200	>30

Note: Utilizing the SPT, "N" value to correlate the consistency and undrained shear strength of cohesive soils is very approximate and needs to be used with caution.

Particle Sizes

Constituent	Description	Size (mm)	Size (in)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	< 0.075	< (200)

ROCK CORING

Rock Quality Designation (RQD) is an indirect measure of the number of fractures within a rock mass, Deere et al. (1967). It is the sum of sound pieces of rock core equal to or greater than 100 mm recovered from the core run, divided by the total length of the core run, expressed as a percentage. If the core section is broken due to mechanical or handling, the pieces are fitted together and if 100 mm or greater included in the total sum.

Intact Rock Strength

Intact Strength (Mpa)	Description
< 1	Extremely low strength
1-5	Very low strength
5-25	Low strength
25-50	Medium strength
50-100	High strength
100-250	Very high strength
>250	Extremely high strength

Rock Mass Quality

RQD Classification	RQD Value (%)
Very Poor Quality	<25
Poor Quality	25 to 50
Fair Qualty	50 to 75
Good Quality	75 to 90
Excellent Quality	90 to 100

Rock Mass Weathering

Term	Description
Unweathered (Fresh)	No visible sign of material weathering to discoloration on major discontinuity surfaces.
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity of surfaces. All the rock material may be discolored by weathering and may be somewhat weaker than its fresh condition.
Moderatly Weathered	Less than half the rock material is decomposed and/or disintegrates to soil. Fresh or discolored rock is present either as a continuous frame work of as core stones.
Highly Weathered	More than half the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a discontinuous frame work or as core stones.
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is largely intact.
Residual Soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

Joint and Foliation Spacing

Description	Spacing
Very Wide	Greater than 3 m
Wide	1 m to 3 m
Moderately Close	0.3 m to 1 m
Close	50 mm to 300 mm
Very Close	Less than 50 mm

Bedding Thickness

Description	Spacing
Very thick	Greater than 2 m
Thick	0.6 m to 2 m
Medium	0.2 m to 0.6 m
Thin	60 mm to 0.2 m
Very thin	20 mm to 60 mm
Laminated	6 to 20 mm
Thinly Laminated	Less than 6 mm

SYMBOLS

General

w_N Natural water content within the soil sample
γ Unit weight
γ' Effective unit weight
γ_D Dry unit weight
γ_{SAT} Saturated unit weight
ρ Density
ρ_S Density of solid particles
ρ_w Density of water
ρ_D Dry density
ρ_{SAT} Saturated density
e Void ratio
n Porosity
S Degree of saturation
E_{50} Fifty percent secant modulus

Consistency

w_L Liquid Limit
w_P Plastric Limit
I_P Plasticity Index
w_S Shrinkage limit
I_L Liquidity index
I_C Consistency index
e_{max} Void ratio in loosest state
e_{min} Void ratio in densest state
I_D Density index (formerly relative density)

Shear Strength

S_u Undrained shear strength parameter (total stress)
c' Effective cohesion intercept
ϕ' Effective friction angle
τ_R Peak shear strength
τ_R Residual shear strength
δ Angle of interface friction
μ Coefficient of friction = tan ϕ'

Consolidation

C_c Compression index (normally consolidated range)
C_r Recompression index (over consolidated range)
m_v Coefficient of volume change
c_v Coefficient of consolidation
T_v Time factor (vertical direction)
U Degree of consolidation
σ'_v Effictive overburden pressure
OCR Overconsolidation ratio

APPENDIX C

BOREHOLE LOGS

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-01

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION 535 Queen Street ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154104 EASTING 704802 CHECKED BY UK

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
182.7	Top of Ground										
0.0 / 182.6	**ASPHALTt** - 80mm										
0.1 / 181.9	**FILL - SAND and GRAVEL -** some silt, trace to some clay, brown, non-cohesive, dry		1	AS	0					○	Slight Odour
0.8 / 180.4	**(ML) - SANDY SILT -** trace to some clay, light brown, non-cohesive, moist, loose		2	SS	9			182		○	0 25 (75)
			3	SS	4			181		○	Grinding on inferred bedrock
2.3 / 179.8	**(GW) - SANDY GRAVEL -** some sand, some silt, presence of cobbles and boulders, possible sandstone fragments, non-cohesive, moist, very dense		4	SS	55			180		○	
2.9	**Auger Refusal** End of Borehole										

200 + : Numbers refer to Field Vane Over Limit + 3, × 3 : Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-02

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154119 EASTING 704793 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
182.7	Top of Ground								
0.0 / 182.6	**ASPHALT** - 80mm								
0.1	**FILL - SAND and GRAVEL** - some silt, trace to some clay, brown, non-cohesive, dry		1	AS	28				Augered through 0.15 m of frost at ground surface
181.9								182	
0.8	**(ML) - SANDY SILT** - trace to some clay, TILL, light brown, non-cohesive, moist, very loose to compact		2	SS	2				Rock in tip of SS2. No recovery
			3	SS	1			181	Grinding at 2.13m
	Increasing moisture content in SS4		4	SS	11			180	
179.7									
3.0	**GW - SANDY GRAVEL** - some sand, some silt, presence of cobbles and boulders, possible sandstone fragements, non-cohesive, moist, very dense		5	SS	60				
179.4									
3.3	**Auger Refusal** End of Borehole								

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L

WATER CONTENT (%): 20 40 60

200 + : Numbers refer to Field Vane Over Limit + 3, × 3 : Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-03

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154088 EASTING 704767 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
182.3	Top of Ground										
0.0 / 182.2	**ASPHALT** - 80mm										0.05m of frost
0.1	**FILL - SAND and GRAVEL** - trace gravel, brown, non-cohesive, moist		1	AS				182			
181.5											
0.8	**(SM) - SILTY SAND** - trace to some gravel, red, non-cohesive, moist, compact		2	SS	19						
								181			
	Increase in silt content, decrease in gravel content		3	SS	31						7 47 (46)
180.0											
2.3	**(GW) - SANDY GRAVEL** - some sand, some silt, presence of cobbles and boulders, posisble sandstone fragments, non-cohesive, moist, very dense		4	SS	60			180			
179.7											
2.6	**Auger Refusal** End of Borehole										

200_{+} : Numbers refer to Field Vane Over Limit $+^{3}, \times^{3}$: Numbers refer to Sensitivity $O^{3\%}$ STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-04

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154079 EASTING 704748 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
181.7	Top of Ground										
0.0 / 181.6	**ASPHALT** - 80mm										
0.1	**(SM) - SILTY SAND** - some silt, trace gravel, brown, non-cohesive, moist		1	AS						O	
180.9								181			Grinding at 0.76m, Layers of rock in sample
0.8 / 180.8	**(GW) - SANDY GRAVEL** - some sand, some silt, presence of cobbles and boulders, posible sandstone fragments, non-coehsive, moist, very dense		2	SS	60					O	
0.9	**Auger Refusal** End of Borehole										

200 + : Numbers refer to Field Vane Over Limit +3, ×3 : Numbers refer to Sensitivity O 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-05

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154115 EASTING 704742 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
182.1	Top of Ground										
0.0 / 182.0	**ASPHALT** - 80mm										Asphalt may be mixed in
0.1 / 181.3	**FILL - SAND and GRAVEL**, trace silt, brown to red, non-cohesive, moist		1	AS				182		o	
0.8 / 180.7	**(GW) - SANDY GRAVEL** - some sand, some silt, presence of cobbles and boulders, posible sand stone fragments, moist, very dense		2	SS	54			181		o	46 35 (19)
1.4	**Auger Refusal** End of Borehole										

200 + : Numbers refer to Field Vane Over Limit + 3, × 3 : Numbers refer to Sensitivity O 3% STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-06

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154113 EASTING 704718 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (O UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
181.9	Top of Ground								20 40 60 80 100	20 40 60	
0.0 / 181.8	**ASPHALT** - 80mm										Some asphalt in sample from surface
0.1 / 181.1	**FILL - SAND and GRAVEL** - brown, non-cohesive, moist		1	AS							
0.8 / 180.8	**(GW) - SANDY GRAVEL** - some sand, some silt, presence of cobbles and boulders, possible sandstone fragments, non-cohesive, moist, very dense		2	SS	60			181			
1.1	**Auger Refusal** End of Borehole										

200 + : Numbers refer to Field Vane Over Limit $+^3, \times^3$: Numbers refer to Sensitivity $O^{3\%}$ STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-07

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154099 EASTING 704722 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	SAMPLES: RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100): O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
181.3	Top of Ground										
0.0 / 181.2	**ASPHALT** - 80mm										
0.1	**FILL - SAND and GRAVEL** - some gravel, brown, non-cohesive, moist		1	AS				181			
180.4			2	SS							
0.9	**Auger Refusal** End of Borehole										

200 + : Numbers refer to Field Vane Over Limit +^{3}, ×^{3}: Numbers refer to Sensitivity O$^{3\%}$ STRAIN AT FAILURE

TULLOCH ENGINEERING

RECORD OF BOREHOLE No BH-08

1 OF 1 **METRIC**

JOB NUMBER 19-1866 LOCATION Bingham Parking ORIGINATED BY RM

CLIENT City of SSM DATUM _____ BOREHOLE TYPE HSA/SS COMPILED BY SK

DRILLER North Drilling DATE 2020.12.10 - 2020.12.10 NORTHING 5154117 EASTING 704783 CHECKED BY UK

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	RECOVERY RATIO	GROUND WATER CONDITIONS	ELEVATION	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
182.7	Top of Ground								
0.0 / 182.6	**ASPHALT** - 80mm								0.03 m of asphalt at top of sample
0.1 / 181.9	**FILL - SAND and GRAVEL** - brown, non-cohesive, moist		1	AS				182	
0.8 / 180.4	**(ML) - SANDY SILT** - some gravel, light brown to brown, non-cohesive, moist to wet		2	SS	14				
			3	SS	3			181	
2.3 / 179.1	**(SM) SILTY SAND** - trace gravel, brown to red, non-cohesive, wet, loose to compact		4	SS	5				29 45 (26)
			5	SS	15			180	
3.6	**Auger Refusal** End of Borehole								

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%): 20 40 60

200 + : Numbers refer to Field Vane Over Limit

+ 3, × 3 : Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

APPENDIX D

LABORATORY RESULTS

TULLOCH ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories | Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866 DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza SOURCE: Boreholes

DATE TESTED: 1/20/2020 TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-01 SS2	0.8 to 1.4	613.88	536.20	163.42	77.68	20.8%
	BH-03 SS3	1.5 to 2.1	973.40	898.40	162.55	75	10.2%
	BH-05 SS2	0.8 to 1.2	932.60	892.80	161.87	39.8	5.4%
	BH-08 SS4	2.3 to 2.9	631.60	569.29	162.27	62.31	15.3%

REMARKS:

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3
Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadie des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866 DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza SOURCE: Boreholes

DATE TESTED: 1/24/2020 TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-01 AS1	0.0 to 0.6	96.99	85.83	24.23	11.16	18.1%
	BH-01 SS3	1.5 to 2.1	86.81	73.68	16.36	13.13	22.9%
	BH-01 SS4	2.3 to 2.9	814.70	783.20	157.63	31.5	5.0%

REMARKS:

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadie des laboratoiret indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866
DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza
SOURCE: Boreholes

DATE TESTED: 1/24/2020
TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-02 SS1	0.2 to 0.6	436.30	428.02	156.70	8.28	3.1%
	BH-02 SS2	0.8 to 1.4	51.27	50.55	16.95	0.72	2.1%
	BH-02 SS3	1.5 to 2.1	86.36	82.49	20.83	3.87	6.3%
	BH-02 SS4	2.8 to 2.9	73.14	59.80	15.03	13.34	29.8%
	BH-02 SS5	3.0 to 3.7	333.58	310.69	155.29	22.89	14.7%

REMARKS:

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3
Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866
DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza
SOURCE: Boreholes

DATE TESTED: 1/24/2020
TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-03 AS1	0.0 to 0.6	1035.70	1002.90	167.11	32.8	3.9%
	BH-03 SS2	0.8 to 1.4	126.27	121.18	19.76	5.09	5.0%
	BH-03 SS4	2.3 to 2.6	109.41	104.54	18.53	4.87	5.7%

REMARKS: Rip in the bag for BH-03 AS1

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3
Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866 DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza SOURCE: Boreholes

DATE TESTED: 1/24/2020 TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-04 AS1	0.0 to 0.6	1148.10	1108.50	169.89	39.6	4.2%
	BH-04 SS2	0.8 to 0.9	110.17	106.18	19.56	3.99	4.6%

REMARKS:

CLIENT:

COPIES TO:

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866
DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza
SOURCE: Boreholes

DATE TESTED: 1/24/2020
TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-05 AS1	0.0 to 0.6	117.32	112.27	20.09	5.05	5.5%

REMARKS:

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3
Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866
DATE SAMPLED: 12/10/2019
PROJECT: City Downtown Plaza
SOURCE: Boreholes
DATE TESTED: 1/24/2020
TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-06 SS1	0.0 to 0.6	1153.40	1119.50	170.66	33.9	3.6%
	BH-06 SS2	0.8 to 1.1	1432.40	1315.40	156.33	117	10.1%

REMARKS:

CLIENT:

COPIES TO:

TULLOCH
ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866

DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza

SOURCE: Boreholes

DATE TESTED: 1/24/2020

TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-07 SS1	0.0 to 0.6	79.85	74.75	16.22	5.1	8.7%
	BH-07 SS2	0.8 to 1.4	55.89	52.65	16.39	3.24	8.9%

REMARKS:

CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

TULLOCH ENGINEERING

CSA A283 Certified Laboratory for Concrete Testing
CCIL Certified Laboratory for Aggregates and Asphalt Testing
CSA/CCIL Certified Technicians

Canadian Council of Independent Laboratories
Conseil canadien des laboratoires indépendants

WATER CONTENT TEST

TEST METHOD: LS 701 / ASTM C 566 / D 2216

CONTRACT NO: 19-1866 DATE SAMPLED: 12/10/2019

PROJECT: City Downtown Plaza SOURCE: Boreholes

DATE TESTED: 1/24/2020 TESTED BY: T. Linley

			Gross (inc. Tare) (g)				
Tare ID	Sample ID	Depth (m)	Wet Weight	Dry Weight	TARE	Mass Lost	Water %
	BH-08 SS1	0.0 to 0.6	94.30	91.86	13.76	2.44	3.1%
	BH-08 SS2	0.8 to 1.4	93.18	86.53	13.91	6.65	9.2%
	BH-08 SS3	1.5 to 2.1	99.36	90.69	13.74	8.67	11.3%
	BH-08 SS5	3.0 to 3.6	128.69	116.20	13.66	12.49	12.2%

REMARKS: Rip in bag for BH-08 SS5

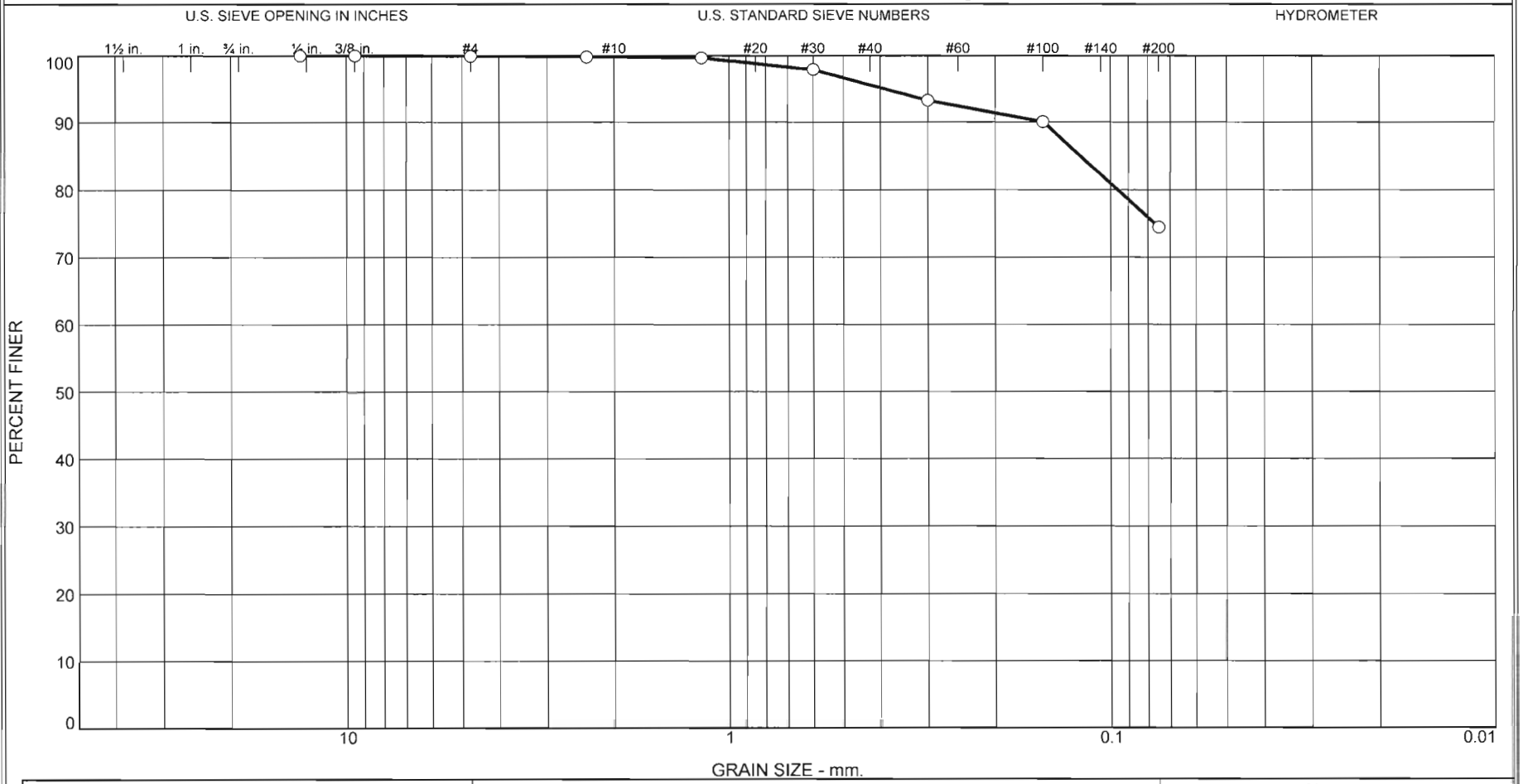
CLIENT:

COPIES TO:

Tulloch Engineering, Materials Testing Laboratory, 71 Black Road - Unit 3, Sault Ste. Marie, ON. Canada P6B 0A3

Tel: (705) 949-1457 Fax: (705) 945-5092 email: thomas.edmonds@tulloch.ca

Particle Size Distribution Report



% Gravel		% Sand			% Fines
Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	0.1	0.1	4.2	21.1	74.5

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-01 Depth: 0.8m - 1.4m Sample Number: SS2	Dec 10, 2019		Jan 21, 2020

Client Brook Mcilroy

Project City Downtown Plaza

Project No. 19-1866

TULLOCH ENGINEERING
71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3
T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
Daren.Stadnisky@TULLOCH.ca

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

1/22/2020

Client: Brook Mcilroy
Project: City Downtown Plaza
Project Number: 19-1866
Location: BH-01
Depth: 0.8m - 1.4m **Sample Number:** SS2
Date Sampled: Dec 10, 2019 **Date Tested:** Jan 21, 2020
Tested by: T. Linley

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 333.80
Tare Wt. = 163.42
Minus #200 from wash = 54.3%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
536.20	163.42	13.2mm.	0.00	0.00	100.0
		9.5mm.	0.00	0.00	100.0
		#4	0.30	0.00	99.9
		#8	0.30	0.00	99.8
		#16	0.60	0.00	99.7
		#30	6.70	0.00	97.9
		#50	17.30	0.00	93.2
		#100	11.80	0.00	90.1
		#200	58.10	0.00	74.5

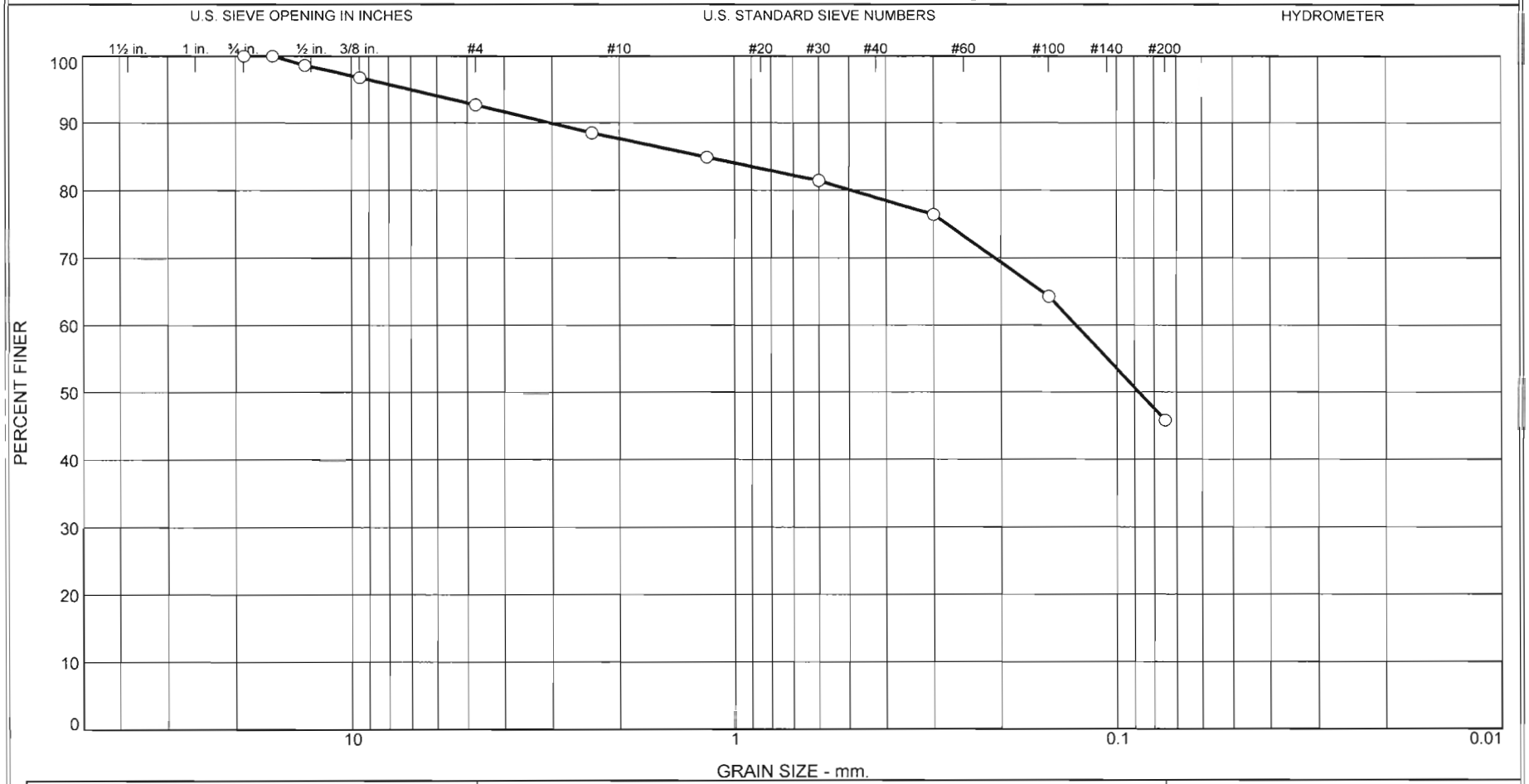
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.1	4.2	21.1	25.4			74.5

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.0958	0.1197	0.1495	0.3902

Fineness Modulus
0.19

Particle Size Distribution Report



% Gravel		% Sand			% Fines
Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	7.3	5.0	8.8	33.1	45.8

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-03 Depth: 1.5m - 2.1m Sample Number: SS3	Dec 10, 2019		Jan 21, 2020

Client Brook McIlroy

Project City Downtown Plaza

Project No. 19-1866

TULLOCH ENGINEERING
71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3
T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
Daren.Stadnisky@TULLOCH.ca

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

1/22/2020

Client: Brook Mcilroy
Project: City Downtown Plaza
Project Number: 19-1866
Location: BH-03
Depth: 1.5m - 2.1m **Sample Number:** SS3
Date Sampled: Dec 10, 2019 **Date Tested:** Jan 21, 2020
Tested by: T. Linley

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare** = 632.20
Tare Wt. = 162.55
Minus #200 from wash = 36.2%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
898.40	162.55	19mm.	0.00	0.00	100.0
		16mm.	0.00	0.00	100.0
		13.2mm.	10.20	0.00	98.6
		9.5mm.	13.60	0.00	96.8
		#4	30.10	0.00	92.7
		#8	30.60	0.00	88.5
		#16	26.50	0.00	84.9
		#30	25.70	0.00	81.4
		#50	36.80	0.00	76.4
		#100	89.10	0.00	64.3
		#200	136.40	0.00	45.8

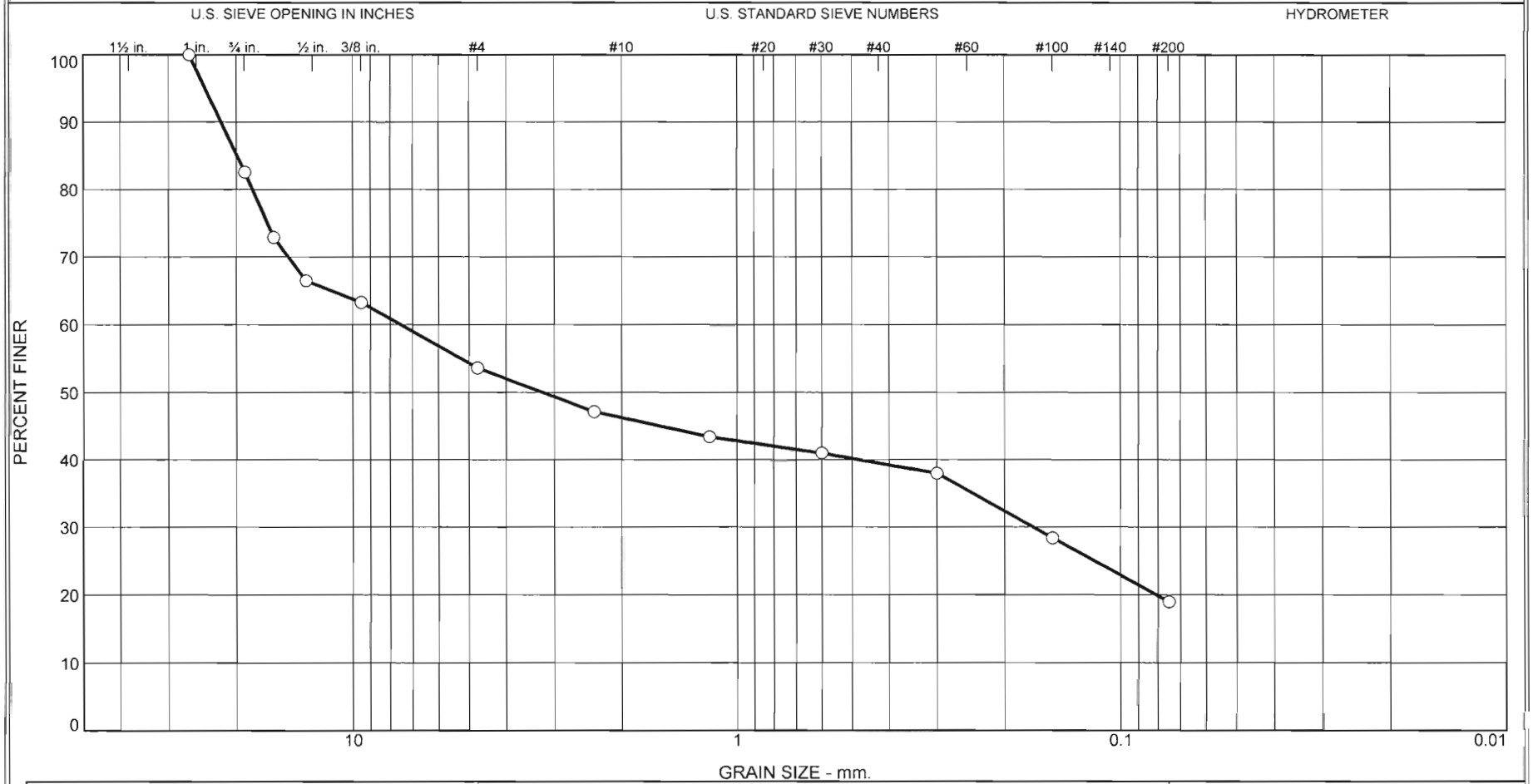
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	7.3	7.3	5.0	8.8	33.1	46.9			45.8

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.0878	0.1277	0.4926	1.1994	3.0288	7.0435

Fineness Modulus
1.15

Particle Size Distribution Report



	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
○	17.3	29.1	7.4	6.7	20.5	19.0

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-05 Depth: 0.8m - 1.2m Sample Number: SS2	Dec 10, 2019		Jan 21, 2020

Client Brook Mcilroy

Project City Downtown Plaza

Project No. 19-1866

TULLOCH ENGINEERING
71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3
T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
Daren.Stadnisky@TULLOCH.ca

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

1/22/2020

Client: Brook Mcilroy
Project: City Downtown Plaza
Project Number: 19-1866
Location: BH-05
Depth: 0.8m - 1.2m **Sample Number:** SS2
Date Sampled: Dec 10, 2019 **Date Tested:** Jan 21, 2020
Tested by: T. Linley

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 768.20
Tare Wt. = 161.87
Minus #200 from wash = 17.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
892.80	161.87	26.5mm.	0.00	0.00	100.0
		19mm.	127.30	0.00	82.6
		16mm.	70.90	0.00	72.9
		13.2mm.	46.70	0.00	66.5
		9.5mm.	23.50	0.00	63.3
		#4	70.50	0.00	53.6
		#8	47.50	0.00	47.1
		#16	27.30	0.00	43.4
		#30	17.80	0.00	41.0
		#50	21.90	0.00	38.0
		#100	70.30	0.00	28.4
		#200	68.60	0.00	19.0

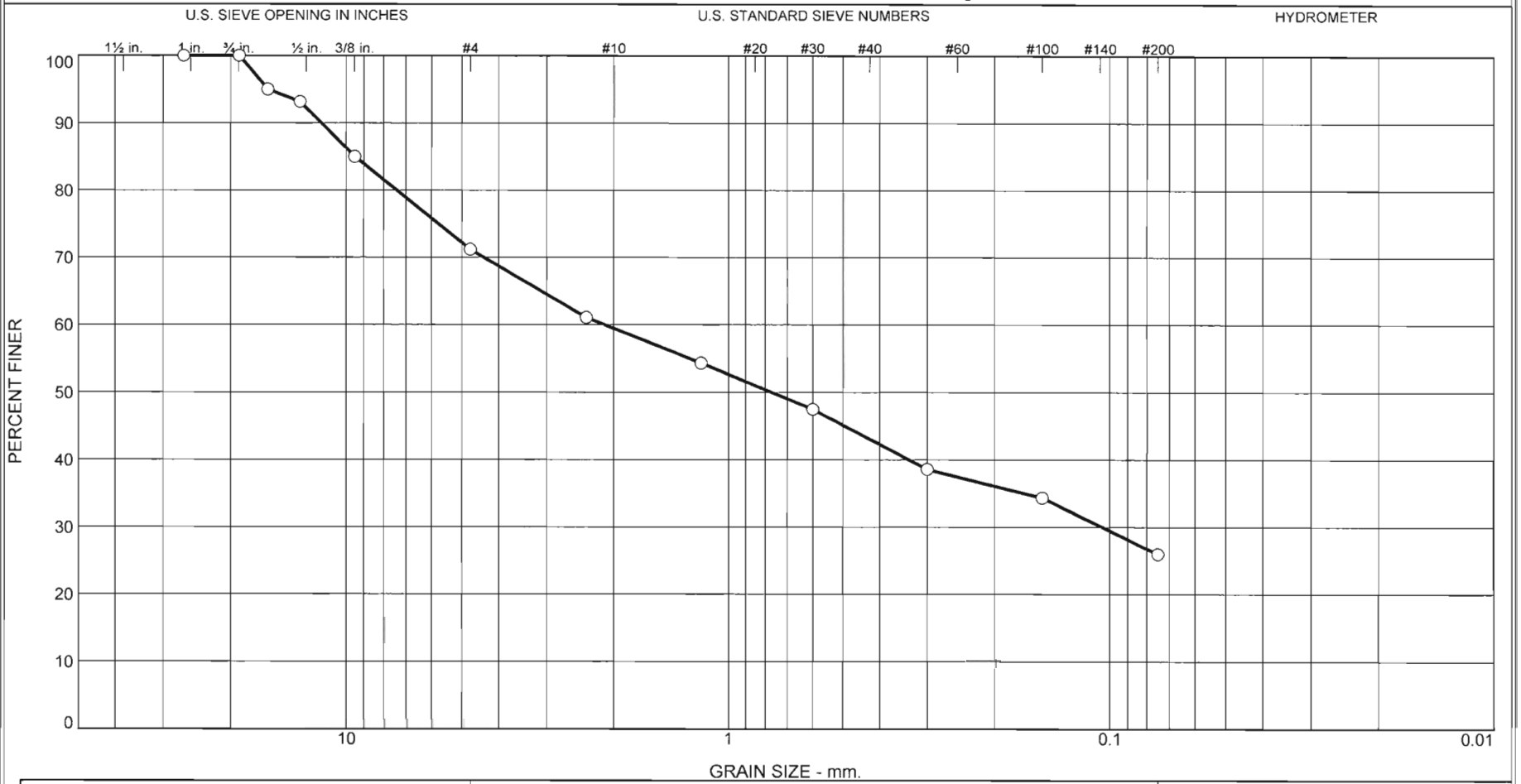
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	17.3	29.1	46.4	7.4	6.7	20.5	34.6			19.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0810	0.1689	0.4799	3.2122	7.5052	18.1499	19.8975	21.8918	24.0859

Fineness Modulus
4.03

Particle Size Distribution Report



% Gravel		% Sand			% Fines
Coarse	Fine	Coarse	Medium	Fine	Silt
0.0	28.8	11.7	16.5	17.0	26.0

Identification	Date Sampled	Date Received	Date Tested
Source of Sample: BH-08 Depth: 2.3m - 2.9m Sample Number: SS4	Dec 10, 2019		Jan 21, 2020

Client Brook Mcilroy

Project City Downtown Plaza

Project No. 19-1866

TULLOCH ENGINEERING
71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3
T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
Daren.Stadnisky@TULLOCH.ca

Tested By: T. Linley

GRAIN SIZE DISTRIBUTION TEST DATA

1/22/2020

Client: Brook Mcilroy
Project: City Downtown Plaza
Project Number: 19-1866
Location: BH-08
Depth: 2.3m - 2.9m **Sample Number:** SS4
Date Sampled: Dec 10, 2019 **Date Tested:** Jan 21, 2020
Tested by: T. Linley

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare** = 498.90
Tare Wt. = 162.27
Minus #200 from wash = 17.3%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
569.29	162.27	26.5mm.	0.00	0.00	100.0
		19mm.	0.00	0.00	100.0
		16mm.	20.30	0.00	95.0
		13.2mm.	7.40	0.00	93.2
		9.5mm.	33.10	0.00	85.1
		#4	56.50	0.00	71.2
		#8	41.20	0.00	61.1
		#16	27.30	0.00	54.4
		#30	28.00	0.00	47.5
		#50	36.20	0.00	38.6
		#100	17.30	0.00	34.3
		#200	33.90	0.00	26.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	28.8	28.8	11.7	16.5	17.0	45.2			26.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.1046	0.3352	0.7693	2.1155	7.3781	9.4706	11.6001	15.9788

Fineness Modulus
3.08

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS

Client:	Rod Morrison	Work Order Number:	390254
Company:	Tulloch Engineering-Sault Ste. Marie	PO #:	
Address:	71 Black Road	Regulation:	O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
	Sault Ste. Marie, ON, P6B 0A3	Project #:	19-1866
Phone/Fax:	(705) 949-1457 / (705) 949-9606	DWS #:	
Email:	rod.morrison@tulloch.ca	Sampled By:	Rod Morrison
Date Order Received:	12/12/2019	Analysis Started:	12/13/2019
Arrival Temperature:	5 °C	Analysis Completed:	12/19/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH1 AS1	1504218	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	12/10/2019	
BH3 AS1	1504219	Soil	None		12/10/2019	
BH6 AS1	1504220	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	12/10/2019	
BH8 SS5	1504221	Soil	None	SAMPLE CONTAINED RESULT EXCEEDENCES.	12/10/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Anions Soil (A5)	Garson	Determination of Anions in Soil	Modified from SW846-9056A
BTEX/F1 Soil (A127)	Garson	Determination of PHC BTEX/F1 in Soil - Tier 1 CCME	Modified from CWS PHC Tier I CCME
Cond Soil (R12)	Garson	Determination of conductivity in soil (1:2)	Modified from EPA SW846-9050A
Moisture (A99)	Garson	Determination of Percent Moisture	In-House
PAH+ Soil SIM (A41)	Garson	Determination of PAH in Soil by GC/MS	Modified from SW846-8270D
pH Soil (R2)	Garson	Determination of soil pH by Ion Selective Electrode	Modified from EPA SW-846 9045D
PHC F2-F4 Soil (A59)	Garson	Determination of PHC (F2-F4) in Soil - Tier 1 CCME by GC/FID	Modified from CWS PHC Tier I CCME
PHC F2-F4 Soil - PAH (A59)	Garson	Calculation of PHC F2-F4 With PAHs Subtracted	Modified from CWS PHC Tier I CCME

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Method	Lab	Description	Reference
RedOx - Soil (T06)	Mississauga	Determination of RedOx Potential of Soil	Modified from APHA-2580B
Resistivity Soil (R12)	Garson	Determination of Resistivity in Soil (1:2)	Modified from Carter 18.3
Sulphide/S (R98)	Garson	Determination of Sulphide in Soil	In-House
VOC Methanol Soil (A14)	Garson	Determination of Volatile Organic Compounds in Soil by P&T/GC/MS	Modified from SW846 M8260

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

WORK ORDER RESULTS

Sample Description	BH8 SS5			
Sample Date	12/10/2019 12:00 AM			
Lab ID	1504221			
Anions	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Bromide	<0.2 [<0.2]	0.2	µg/g	~
Chloride	47.1 [41.0]	0.4	µg/g	~
Fluoride	1.3 [1.0]	0.2	µg/g	~
Nitrate (as N)	<0.2 [<0.2]	0.2	µg/g	~
Nitrite (as N)	<0.1 [<0.1]	0.1	µg/g	~
Sulphate	14 [12]	2	µg/g	~

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
General Chemistry	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Result**	**MDL**	**Units**	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
% Moisture	16.2	0.1	4.3	0.1	3.8	0.1	11.5	0.1	%	~
Conductivity							171 [168]	1	µS/cm	570
pH	7.48 [7.51]	N/A					7.5	N/A	pH	~
RedOx (vs. S.H.E.)							227 [226]	N/A	mV	~
Resistivity							5860	N/A	ohm-cm	~

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Sulphide							<5 [<5]	5	µg/g	~

Sample Description	BH1 AS1		BH3 AS1		BH6 AS1		BH8 SS5			
Sample Date	12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM		12/10/2019 12:00 AM			
Lab ID	1504218		1504219		1504220		1504221			
PAH	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
1+2-Methylnaphthalene (Calc.)	1.31	0.03	<0.03	0.03	<0.02	0.02	<0.02	0.02	µg/g	0.59
Acenaphthene	1.69	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.072
Acenaphthylene	0.56	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.093
Anthracene	1.92	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.16
Benzo(a)anthracene	7.6	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	0.36
Benzo(a)pyrene	2.6	0.2	<0.02	0.02	<0.02	0.02	0.01	0.01	µg/g	0.3
Benzo(b)fluoranthene	6.9	0.2	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.47
Benzo(ghi)perylene	1.88	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.68
Benzo(k)fluoranthene	2.04	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.48
Chrysene	5.7	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	2.8
Dibenz(a,h)anthracene	0.44	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.1
Fluoranthene	13.0	0.2	<0.02	0.02	<0.02	0.02	0.02	0.01	µg/g	0.56
Fluorene	2.11	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.12
Indeno(1,2,3-c,d)pyrene	1.75	0.02	<0.02	0.02	<0.02	0.02	<0.01	0.01	µg/g	0.23

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. If multiple re-runs exist they are suffixed by a number. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

LCL: Lower Control Limit.

UCL: Upper Control Limit.

QAQCID: This is a unique reference to the quality control data set used to generate the reported value. Contact our lab for this information, as it is traceable through our LIMS.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

QUALITY CONTROL DATA

THIS SECTION REPORTS QC RESULTS ASSOCIATED WITH THE TEST BATCH; THESE ARE NOT YOUR SAMPLE RESULTS.
QAQC details include only values where sufficient sample data allowed measurement.

Anions

Blank: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	0.2	µg/g	0	<0.2	0.6	20191217.A5G
Chloride	0.4	µg/g	0	<0.4	1.2	20191217.A5G
Fluoride	0.02	µg/g	0	<0.02	0.6	20191217.A5G
Nitrate (as N)	0.2	µg/g	0	<0.2	0.6	20191217.A5G
Nitrite (as N)	0.1	µg/g	0	<0.1	0.18	20191217.A5G
Sulphate	0.4	µg/g	0	<0.4	6	20191217.A5G

Positive Control: LFB-5 (0.1/0.02/0.002 mg/g equiv) (5)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	84.8	120	20191217.A5G
Chloride	N/A	%	80	105	120	20191217.A5G
Fluoride	N/A	%	80	97.8	120	20191217.A5G
Nitrate (as N)	N/A	%	80	99.9	120	20191217.A5G
Nitrite (as N)	N/A	%	80	105	120	20191217.A5G
Sulphate	N/A	%	80	93	120	20191217.A5G

Positive Control: LFB-7 (0.2/0.1/0.02 mg/g equiv) (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Bromide	N/A	%	80	92	120	20191217.A5G
Chloride	N/A	%	80	104	120	20191217.A5G
Fluoride	N/A	%	80	101	120	20191217.A5G
Nitrate (as N)	N/A	%	80	98.4	120	20191217.A5G
Nitrite (as N)	N/A	%	80	94.5	120	20191217.A5G
Sulphate	N/A	%	80	107	120	20191217.A5G

Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Chloride	N/A	%	0	13.8	35	20191217.A5G

General Chemistry

Calibration Check: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	N/A	%	475	497	525	20191219.TM-G.R12B

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity	1	µS/cm	0	<1	5	20191219.TM-G.R12B

Positive Control: LCS (pH 8) (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH	N/A	pH	7.8	7.95	8.2	20191219.TM-G.R2B

Positive Control: LRB-6 (Blank) (6)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Sulphide	0.02	µg/g	0	<0.02	0.06	20191219.R98B

Positive Control: ORP Control 240 (7)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)	N/A	mV	220	244	260	20191219.TM-M.A6B

Sample Replicate: % RPD (3)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
pH		pH	0	0.03	0.3	20191219.TM-G.R2B

Sample Replicate: % RPD (8)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Conductivity		%	0	1.8	10	20191219.TM-G.R12B

Sample Replicate: % RPD (9)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
RedOx (vs. S.H.E.)		%	0	0.4	10	20191219.TM-M.A6B

PAH

Method Blank: Method Blank (1)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(b)fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(ghi)perylene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Benzo(k)fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Chrysene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Dibenz(a,h)anthracene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Fluoranthene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Fluorene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Indeno(1,2,3-c,d)pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Naphthalene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Phenanthrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs
Pyrene	0.01	µg/g	0	<0.01	0.5	20191216.TM-G.A41PAHs

Positive Control: Lab Control Sample (2)

Parameter	MDL	Units	LCL	Result	UCL	QAQCID
Acenaphthene	0.01	% Rec	50	84.2	140	20191216.TM-G.A41PAHs
Acenaphthylene	0.01	% Rec	50	74	140	20191216.TM-G.A41PAHs
Anthracene	0.01	% Rec	50	71	140	20191216.TM-G.A41PAHs
Benzo(a)anthracene	0.01	% Rec	50	138	140	20191216.TM-G.A41PAHs
Benzo(a)pyrene	0.01	% Rec	50	52.6	140	20191216.TM-G.A41PAHs

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

BH1 AS1	1504218	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH1 AS1	1504218	pH Soil (R2)	20191219.TM-G.R2B
BH1 AS1	1504218	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH1 AS1	1504218	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH1 AS1	1504218	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH1 AS1	1504218r	pH Soil (R2)	20191219.TM-G.R2B
BH1 AS1	1504218r	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH3 AS1	1504219	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH3 AS1	1504219	Moisture (A99)	20191213.TM-G.A99moist
BH3 AS1	1504219	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH3 AS1	1504219	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH3 AS1	1504219	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH3 AS1	1504219	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH6 AS1	1504220	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH6 AS1	1504220	Moisture (A99)	20191213.TM-G.A99moist
BH6 AS1	1504220	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH6 AS1	1504220	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH6 AS1	1504220	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH6 AS1	1504220	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs
BH8 SS5	1504221	Anions Soil (A5)	20191217.A5G
BH8 SS5	1504221	BTEX/F1 Soil (A127)	20191216.TM-G.A127s
BH8 SS5	1504221	Cond Soil (R12)	20191219.TM-G.R12B
BH8 SS5	1504221	Moisture (A99)	20191213.TM-G.A99moist
BH8 SS5	1504221	PAH+ Soil SIM (A41)	20191216.TM-G.A41PAHs
BH8 SS5	1504221	pH Soil (R2)	20191219.TM-G.R2B
BH8 SS5	1504221	PHC F2-F4 Soil (A59)	20191216.TM-G.A59F2s
BH8 SS5	1504221	PHC F2-F4 Soil - PAH (A59)	20191216.TM-G.A59calc
BH8 SS5	1504221	RedOx - Soil (T06)	20191219.TM-M.A6B
BH8 SS5	1504221	Resistivity Soil (R12)	20191219.TM-G.R12C
BH8 SS5	1504221	Sulphide/S (R98)	20191219.R98B
BH8 SS5	1504221	VOC Methanol Soil (A14)	20191219.TM-G.A14VOCs

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Tulloch Engineering-Sault Ste. Marie

Work Order Number: 390254

BH8 SS5	1504221r	Anions Soil (A5)	20191217.A5G
BH8 SS5	1504221r	Cond Soil (R12)	20191219.TM-G.R12B
BH8 SS5	1504221r	RedOx - Soil (T06)	20191219.TM-M.A6B
BH8 SS5	1504221r	Sulphide/S (R98)	20191219.R98B

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

APPENDIX E

NOTICE TO READER

NOTICE TO READER

This Report has been prepared by TULLOCH Engineering Inc. ('TULLOCH') for the sole and exclusive use of Brook McIlroy (the 'Client') to support subsurface and pavement design for the proposed development of the downtown civic plaza (the 'Development') in Sault Ste. Marie, Ontario (the 'Site'). The Report shall not be used for any other purpose, or provided to, relied upon or used by any third party without the express written consent of TULLOCH.

A limited number of boreholes were advanced at the Site; and as such, the information collected and presented herein applies to the borehole and test pit locations only. The subsurface conditions between boreholes and test pits can change and accordingly any use of the data contained in this Report should take into consideration the nature of the materials and potential variation between boreholes and test pits.

This Report contains opinions, conclusions and recommendations made by TULLOCH using professional judgment and reasonable care for the purpose of foundation design for the Development. Use of or reliance on this report by the Client is subject to the following conditions:

a) the report being read in the context of and subject to the terms of the Engineering Services Agreement for the Work, including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions specified or agreed therein;
b) the report being read in its entirety. TULLOCH is not responsible for the use of portions of the report without reference to the entire report;
c) the conditions of the site may change over time or may have already changed due to natural forces or human intervention, and TULLOCH takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report;
d) the classification of soils and rocks in this report is based on commonly accepted methods. However, the classification of geologic materials and the boundaries between subsurface layers involves judgement. Boundaries between different soils layers may also be transitional rather than abrupt. TULLOCH does not warrant or guarantee the exactness of these descriptions and boundaries.
e) the subsurface conditions must be verified by a qualified geotechnical engineer during construction to ensure that the borehole data presented herein is representative of the actual site conditions so that the design recommendations contained herein remain valid; and
f) the report is based on information made available to TULLOCH by the Client or by certain third parties; and unless stated otherwise in the Agreement, TULLOCH has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

This report has been prepared with the degree of care, skill and diligence normally provided by engineers in the performance of comparable services for projects of similar nature. The scope of this report includes foundation engineering design only and it specifically excludes investigation, detection, prevention and assessment of the presence of subsurface contaminants. No conclusions or inferences should be drawn regarding contamination at the site including but not limited to molds, fungi, spores, bacteria, viruses, soil gases such as Radon, PCBs, petroleum hydrocarbons, inorganic and volatile organic compounds, polycyclic aromatic hydrocarbons and or any by products thereof.

BrookMcIlroy/

Form 2.3

Addendum No. 4

Project	**No.: 19-076**
Tender	**No.: 2022CDE-PE-02-T**
Date:	**April 4, 2022**

Project: **Sault Ste. Marie – Downtown Civic Plaza Building**

The following information supplements and/or supersedes the bid documents issued on **February 25, 2022**.

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number and date on the Tender Form. Failure to do so may subject bidder to disqualification.

See enclosed for additional information to clarify the tender documents previously issued.

1. Architectural Specifications:
    a. Section 08 33 23 – Overhead Coiling Doors
    b. Section 09 67 00 – Fluid-Applied Floor Coatings

END OF ADDENDUM

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Exterior coiling doors:

.1 Overhead coiling insulated metal doors.

1.2 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit engineered shop drawings.

.2 Clearly indicate materials, operating mechanisms, required clearances and electrical connections.

.3 Shop drawings shall indicate that product and installation has been engineered to meet windload design required by building code.

.4 Submit door manufacturer's wind load performance and required installation parts and data required to comply with structural requirements of the building code.

.5 Submit manufacturer's operational requirements and limitations for operating doors under high wind events.

.6 Submit manufacturer's acoustic isolation requirements.

.4 Templates:

.1 Submit information and templates required for installation of work of this section.

1.3 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit operation and maintenance data for incorporation into operations and maintenance manuals.

.2 Submit door manufacturers' recommended operation or procedures to follow when operation doors in a high wind event or restrictions for when a door cannot be used.

1.4 Quality Assurance

.1 Qualifications: Provide work of this section, executed by a *Subcontractor* with minimum 5 years experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.

1.5 Delivery, Storage, and Handling

.1 Package or crate, and brace *Products* to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Exterior overhead coiling door construction shall be designed to withstand windloads in accordance with building code requirements.

.2 Acoustic design requirements:

.1 Design and install sound and vibration isolation pads to effectively isolate overhead door assembly from structure.

2.2 Overhead Coiling Doors

.1 Exterior coiling doors:

.1 Overhead coiling insulated metal doors: Interior face-of -wall mounted.

.2 Acceptable *Products*:

.1 Raynor 'DuraCoil'

.1 Substitutions: in accordance with Section 01 25 00.

.2 Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.

.1 Insulated flat slats:

.1 20 gauge.

.2 Backer: 24 gauge (0.023") thickness.

.3 Insulation: Manufacturer's standard polyisocyanurate.

.3 Finish:

.1 Manufacturer's standard powder coat finish.

.2 Colour: to later selection by *Consultant* from manufacturer's full range.

.3 Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.

.4 Endlocks:

.1 Zinc-plated malleable cast iron endlocks fastened with two zinc-plated steel rivets.

.5 Bottom bar:

.1 Two galvanized steel angles, 38 mm x 38 mm x 3 mm (1-1/2" by 1-1/2" by 1/8") minimum, unless otherwise indicated, with single-contact type bottom astragal.

.6 Guides:

.1 Minimum 5 mm (3/16") thick steel.

.2 Fitted with removable curtain stops.

.3 Structural steel with one coat of hot-dipped galvanized.

.7 Brackets: Minimum 4.8 mm (3/16") thick steel plate attached to wall angle of guide assembly with bolts.

.8 Counterbalance: Helical torsion spring type. Counterbalance shall be housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.8 mm (0.03") per foot of span and to be evenly balanced by helical springs, grease packed and mounted on a continuous steel torsion shaft.

.1 Springs:

.1 100,000 cycle grade.

.2 Install cycle counter device.

.9 Hood: 0.5 mm (0.02") 24 gauge galvanized steel minimum in accordance with ASTM A653. Hood shall be equipped with a rubber seal to inhibit air infiltration through hood cavity. Hood type shall be round.

.10 Weatherstripping: EDPM rubber with an aluminum retainer.

.11 Locking:

.1 Motor operated doors:

.1 Cylinder lock: Provide interlock switch with cylinder lock.

.12 Sound/vibration package: Supply and install neoprene isolators to track and fixing brackets, silent motor, neoprene chain pull and rubber wheels.

2.3 Operation

.1 Manual operation:

.1 Push-up operated type.

.2 Electrical operation:

.1 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: CSA and ULC/c-UL approved.

.2 Electric interlocks to prevent operation when locks are engaged.

.3 Electric operator:

.1 Manufacturer's Optima Jackshaft with manual chain hoist.

.2 Motor horsepower: in accordance with manufacturer's written recommendation for door size.

.3 Power supply: 3 phase, to be coordinated with Divisions 26, 27, and 28.

.4 Control wiring:

.1 Solid state circuitry with provisions for connection of a monitored reversing device, external radio control hook-up and maximum run timer. Provisions for timers to close and mid stop and lock bar sensor capability

.1 Provide three button momentary contact "OPEN-STOP", constant pressure on close (can be changed to momentary to close).

.2 Custom wiring.

.3 Monitored electric reversing edge on door.

.4 Monitored photo electric eyes mounted on jambs.

.5 Operator controls:

.1 Control stations with open, close, and stop buttons.

.1 Push-button.

.2 Control mounting: Surface.

.3 Control locations: Interior.

.6 Control circuit: 24 VAC. Provide step down transformer to suit.

PART 3 - EXECUTION

3.1 Examination

.1 Examine building structure, finishes and conditions at the *Place of the Work*.

.2 Notify *Consultant* of any adverse conditions which could jeopardize system installation or system operation. Do not proceed until such conditions have been documented, assessed, rectified and approved for installation. Starting work indicates acceptance of conditions unless *Consultant* is notified otherwise in writing.

3.2 Installation - General

.1 Comply with manufacturer's written installation requirements and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

.2 Install hangers, brackets, fastenings, door track, operating hardware and fittings, and other specified equipment as recommended by door manufacturer.

.3 Secure guides to steel framing members, header box to side guides and the motor to header box.

.4 Drill and tap door frames to receive hardware. Fasten door tracks and stops to door frame by means of machine bolts; welding will not be permitted.

.5 Fit doors snugly to all edges of jambs and heads of frames. Doors shall operate smoothly and freely under all conditions of operation. Door shall sit in any position in door opening and shall not drift upward or downward.

.6 Install and adjust weatherstripping.

.7 Upon completion of installation of doors and operating equipment, lubricate moving parts prior to putting into operation. Supply oil to gear reduction units and grease sprockets, bearings, cables, link chains and door guides.

3.3 Electrical Wiring

.1 Power shall be brought up to circuit breaker/disconnect switch adjacent to controller under Divisions 26, 27, and 28 - Electrical and in conformance with requirements specified therein.

.2 Wiring from motor to switches, controls, starters, safety devices and other items requiring power shall be carried out under this section.

.3 Use EMT conduit for fixed wiring. Use purpose-made and approved type flexible cables or cords at applicable locations; adequately support so as not to impede access or foul moving parts of equipment.

3.4 Field Quality Control

.1 Work of this section is subject to review by *Owner's* building envelope consultant. Building envelope consultant shall be included in distribution for review of shop drawings, samples, data sheets and mock-ups. Work of this section shall not proceed until acceptance of the foregoing by building envelope consultant.

3.5 Adjusting and Cleaning

.1 Adjust work of this section to ensure free-running, tightly closing and properly counterbalanced operation. Ensure that installation is free from warp, twist or other distortion. Lubricate operating hardware.

.2 Refinish damaged or defective work so that no variation in surface appearance is discernible. Refinish work at site only if approved.

.3 Clean work on completion of installation.

3.6 Closeout Activities

.1 Demonstration:

.1 Provide system demonstration and training to *Owner's* maintenance personnel on procedures and schedules related to start-up and shutdown, troubleshooting, servicing, preventive maintenance and procedures for testing and resetting release devices.

.2 Testing:

.1 Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 Section includes:

.1 Fluid-applied flooring.

1.2 Administrative Requirements

.1 Coordination:

.1 Advise other trades of fixtures and fittings not to be installed until floor coating materials are cured, such as: radiators, painting, decorating, floor-supported equipment or cabinetwork, caulking, plumbing, fixtures, and the like.

1.3 Submittals

.1 Submit required submittals in accordance with Section 01 33 00.

.2 *Product* data sheets:

.1 Submit manufacturer's *Product* data sheets for *Products* proposed for use in the work of this section.

.3 Shop drawings:

.1 Submit shop drawings showing proposed divider strips and start / stop installation lines. Coordinate locations with slab control joints. Lay out divider strips symmetrically in rooms.

.4 Samples:

.1 Submit 305 mm x 305 mm (12" x 12") samples of each specified material, in each specified colour to show successive applications of each coat for *Consultant's* approval.

.2 Submit 305 mm x 305 mm (12" x 12") sample of completed system on rigid backing, demonstrating texture and broadcast aggregate, colour, and sheen, for *Consultant's* approval.

.5 Manufacturers' instructions:

.1 Submit substrate preparation guidelines, installation instructions, and general recommendations.

.6 Submit for approval a list of the floor coating materials intended for use in the *Work* for each substrate condition before installation commences.

.7 Include sample of warranty customized for this Project.

1.4 Closeout Submittals

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Operation and maintenance data:

.1 Submit manufacturer's operation and maintenance instructions for inclusion in the operation and maintenance manuals.

1.5 Quality Assurance

.1 Qualifications:

.1 Manufacturers:

.1 Company specializing in manufacturing the *Products* specified in this section, with minimum 10 years experience.

.2 Installers / applicators / erectors:

.1 Work of this section, executed by competent applicators with minimum 5 years experience in application of *Products* and systems specified and with approval and training of *Product* manufacturers.

.2 *Subcontractor* must be approved by the flooring system manufacturer. Submit *Subcontractor's* certification letter prepared by the flooring system manufacturer.

.3 Execute work of this section only under full time supervision of qualified *Subcontractor's* site supervisor.

.2 Mock-ups:

.1 Provide mock-up panel 5 m^2 (53.8 ft^2) minimum area, of coating system at the *Place of the Work* as part of final installation for approval by *Consultant*, location to be determined by *Consultant*. Mock-up will serve as a benchmark for installation of the system for the *Work*.

.2 Construct mock-up at the *Place of the Work* of cove base at door frames.

1.6 Field Conditions

.1 Ambient conditions:

.1 Unless required otherwise by manufacturer's installation requirements maintain ambient temperature of not less than 13°C and below 32°C, and a floor temperature of not less than 16°C from 24 hours before installation to at least 72 hours after installation. Maintain relative humidity of not higher than 80% during same period.

.2 Ensure that adequate ventilation is provided during installation and curing of materials of this section.

1.7 Delivery, Storage, and Handling

.1 Deliver materials to the *Place of the Work* in sealed undamaged containers clearly labelled with name and batch number.

1.8 Warranty

.1 Warrant work of this section in accordance with Section 01 78 36 and as follows:

.1 Provide workmanship warranty to repair defects that develop during the warranty period.

.2 Defects include: Spalling, cracking, and delamination.

PART 2 - PRODUCTS

2.1 Performance/Design Requirements

.1 Material compatibility: Provide materials that are compatible with one another under conditions of service and application required, as demonstrated by manufacturer based on testing and field experience.

.2 Slip resistance; dry floors: ASTM D2047-17, minimum static coefficient of friction; 0.6 for accessible routes, 0.8 for ramps.

.3 Slip resistance; floors expected to be walked on when wet: DCOF test as referenced in ANSI A137.1-19; performance value shall be not less than 0.42.

2.2 General

.1 Installation of systems specified in this section to be by a single *Subcontractor*.

.2 Materials shall be sourced from one manufacturer unless otherwise specified.

2.3 Fluid-Applied Flooring System

.1 Flooring system:

.1 Thickness: as indicated or scheduled.

.2 Medium-duty, thermal shock resistant, self-levelling polyurethane cementitious screed with top coat.

.1 Body coat; broadcast:

.1 Trowel application.

.2 Aggregate: type as recommended by flooring manufacturer.

.3 Colour: as selected by *Consultant* from manufacturer's standard colours.

.4 Physical requirements:

.1 Bond strength: 3.73 MPa (541 psi) (substrate failure), to ASTM D4541-17.

.2 Surface hardness; Shore D: 83, in accordance with ASTM D2240-15(2021).

.3 Resistance to fungi growth: Rated 0, to ASTM G21-15(2021)e1.

.4 Resistance to mould growth: Rated 10, to ASTM D3273-16.

.5 Acceptable Product: Sika 'Sikafloor -22 NA PurCem'.

.2 Top coat:

.1 High-build, solvent-free polyurethane/cement coating, with broadcast sand for slip resistance.

.1 Chemically resistant.

.2 Finish: matte.

.3 Acceptable Product: Sika 'Sikafloor -33 NA PurCem'.

.3 Substitutions: in accordance with Section 01 25 00.

PART 3 - EXECUTION

3.1 Examination

.1 Verify that specified field conditions are ensured before commencing the work of this section.

.2 Examine surfaces to receive floor coatings. They shall be smooth, sound, dry, and free from conditions that will adversely affect execution, permanence, or quality of work.

.3 Ensure that surfaces to receive coatings can be put into acceptable condition by means of preparation specified in this section.

.4 Floor surfaces to receive coating shall be equivalent to a light steel trowel finish for new or patched concrete surface.

.5 Examine floor surfaces to be coated for slope to drain irregularities which could create non-sloping or ponding conditions on the epoxy coating surface.

.6 Ensure that floor drains are installed flush with top of floor slabs.

.7 Defective work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the work of this section.

.8 Commencement of installation implies acceptance of surfaces as suitable to receive coating system.

3.2 Preparation

.1 After acceptance of surfaces, prepare them as required to receive the work of this section. Remove projections and other conditions that may affect the installation of the flooring system.

.2 Concrete slabs shall have sound surface free of dust, chemicals, grease, oil, laitance and curing agents.

.3 Remove curing compounds, surface hardeners, existing flooring adhesives, and epoxy flooring coatings in accordance with manufacturer's written recommendations.

.4 Fill open control joints, and other cracks and voids with sealant material compatible with floor coating materials.

.5 Remove projections and other conditions which may affect installation of the coating.

.6 Repair surface spalls and imperfections with patching compound approved by manufacturer.

.7 Test surfaces for moisture content to ensure that they are suitable for application, and fully cured. Moisture content of concrete shall be checked using a Delmhorst moisture meter. Moisture content shall be within the limits set by the coating manufacturer prior to commencing work.

.8 Prepare concrete surfaces by mechanical method of steel shotblast, sandblast, or other method approved by coating manufacturer in accordance with International Concrete Repair Institute (ICRI) recommendations to achieve a CSP 3 profile. Thoroughly vacuum clean floors upon completion of blast operation. Substrate to be approved in writing by manufacturer prior to application of coating.

.1 Submit written report to *Consultant* following procedures for manufacturer's field review in accordance with Section 01 45 00.

.9 Cover or mask surfaces adjacent to those receiving coating to protect work of others and property from damage and soil.

3.3 Installation

.1 General:

.1 Apply coatings with care to ensure that no laps, voids, or other marks or irregularities are visible, and with an appearance of uniform colour, sheen and texture, all within limitations of materials and areas concerned.

.2 Match colours and textures of approved samples.

.3 Make clean true junctions with no visible overlap between adjoining applications of coatings.

.4 Install flooring to entire area indicated or scheduled, including coverplates occurring within finished floor areas. Maintain overall continuity of colour and pattern with pieces of flooring installed on cover plates. Tightly butt edges to perimeter of floor around cover plates and to cover plates. Do not install flooring to floor drains occurring within finished floor areas.

.5 Place cloths and other disposable coating materials, that are a fire hazard, in closed metal containers and remove from building every night.

.6 Ensure that spark-proof electrical equipment is used in area where inflammable materials are being applied.

.7 Erect barriers to prevent the entry and presence of personnel not performing work of this section during application of coatings, and for 48 hours following completion of application.

.8 Apply coating system in compliance with coating manufacturer's directions to produce a pinhole free surface that also provides a positive slope to drains in flooring system.

.9 Apply coatings in continuous manner, starting and stopping in straight lines centre at doorways or other building lines; haphazard installation continuation lines will not be permitted.

.2 Application; flooring system:

.1 Terminate flooring in straight lines at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.2 Trowelled or broadcast installation shall not show telegraphing of substrate or trowel or toolmarks.

.3 Trowelled or broadcast installation shall be homogenous free of substrate lines, pockets, bumps and unevenness greater than 1.5 mm (1/16") in 300 mm (12"), not including texture.

.4 Prime coat: mix components and apply primer over prepared substrate at manufacturer's recommended spreading rate, with timing of application coordinated with subsequent application of topping mix to ensure optimum adhesion between flooring materials and substrate.

.5 Body coat: mix components and trowel apply body coats over tacky primer at spreading rates as recommended by manufacturer. Broadcast aggregate into wet body coat. Build up flooring system as required to provide positive slope to drains.

.6 Clean surface prior to application of finish coat for approval by *Consultant*.

.7 Finish coats: Squeegee apply finish coats over tacky primer at spreading rates as recommended by manufacturer.

.3 Use saw cut and chip method at termination locations unless otherwise indicated.

.4 Joints: Where substrate is interrupted by expansion or control joints, provide joint in coating system to comply with details indicated, of if not indicated, as recommended by coating system manufacturer. Fill joints with specified compounds.

.5 Match approved samples in sheen, colour and texture.

3.4 Field Quality Control

.1 Conduct quality control in accordance with Section 01 45 00 and as follows:

.1 Field tests and inspections:

.1 Moisture and alkalinity:

.1 Test for moisture vapour transmission in accordance with ASTM F1869-16a in accordance with manufacturer's written installation requirements. Maximum percentage of moisture acceptable is 1.8 kg/93 m^2 (4 lb/1000 ft^2) in a 24 hour period, unless otherwise specified by manufacturer's printed literature.

.2 Test for surface pH. Levels of pH shall not exceed the written recommendations of the flooring manufacturer and adhesive manufacturer. Test in accordance with ASTM F710-21.

.3 For each test type: Perform 3 tests for flooring applications less than 186 m^2 (2000 square feet) in area, and 1 test per additional 93 m^2 (1000 square feet).

.2 Coating thickness:

.1 Verify to Tooke thickness gauge, and in the presence of *Consultant*, that thicknesses of completed coatings meet specified requirements.

.2 Perform cut through/coring tests where selected by *Consultant* 1 per 93 m^2 (1000 ft^2) in finished areas to determine thicknesses and finishes of epoxy coatings.

.3 Repair areas as a result of inspection and testing work.

3.5 Adjusting and Cleaning

.1 Touch up and refinish minor defective work. Refinish entire coated surface areas where finish is damaged or otherwise unacceptable.

.2 Remove promptly as work progresses spilled or spattered coating materials from surfaces of work performed under other sections. Clean surfaces on completion of work. Do not mar surfaces while removing.

.3 Leave storage and mixing areas in same condition as equivalent spaces in project. Clean flooring just prior to final acceptance using materials and procedures recommended by flooring manufacturer.

.4 Final cleaning is specified in section 01 78 00.

END OF SECTION

BrookMcIlroy/

Form 2.3

Addendum No. 5

Project	**No.: 19-076**
Tender	**No.: 2022CDE-PE-02-T**
Date:	**May 17, 2022**

Project: **Sault Ste. Marie – Downtown Civic Plaza Building**

The following information supplements and/or supersedes the bid documents issued on **February 25, 2022.**

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof.

See enclosed for additional information to clarify the documents previously issued.

1. Alternates approved as per the attached "Project No. 2022-CDC-PE-02-T, Downtown Plaza-Savings Rev 6" (Wednesday April 27, 2022) with the exception noted below.

2. Alternate item 3.d. outlined in the attached is not approved. Approved item to be coordinated via Change Order.

END OF ADDENDUM

AVERY
Construction Limited & Transportation Services

940 Second Line West
Sault Ste. Marie, Ontario, P6C 2L3
Phone: 705-759-4800 Toll Free: 800-461-0525
Facsimile: 705-759-6775
Email: info@averyconstruction.ca
www.averyconstruction.ca

City of Sault Ste Marie
99 Foster Drive,
Sault Ste Marie, ON P6A 5X6

RE: Project No. 2022CDE-PE-02-T, Downtown Plaza - Savings Rev 6 **Wednesday, April 27, 2022**

Please see below the *revised (rev 6)* list of potential items that we feel can be considered for savings for this project.

Alternative Price Options as per Section 00 43 23

ADDITION - Alternative Price #1 - Supply & Install Wood Fencing in Lieu of Omega UNIK Fence - $13,211.00
DELETION - Alternative Price #4 - Delete Omega UNIK Metal Fence from the Work - $22,045.00
Total savings as above - Confirmed April 22 - $8,834.00

Alternative Price Options as Proposed by Avery

1. **Roof Deck Alternative - Propose to substitute 1 ½" metal decking in place of the originally specified timber decking. Roof**
    a. DELETION - Douglas fir timber plank decking - $76,445.00
    b. ADDITION - 1 ½" Metal deck to replace the timber plank decking - $28,750.00
    c. Total savings for this item - Confirmed April 22 - $47,695.00
2. **Cast In Place Concrete Options - Division 3**
    a. DELETION - Curved Bleacher Seating - Use Squared Corners - $10,000.00
        i. Drawing L4.02 (see markups included in this package)
    b. Total savings for cast in place concrete - Confirmed April 27 - $10,000.00
3. **Electrical Scope Options - Division 26**
    a. DELETION - Short Circuit, Coordination, and Arc Flash Study - $2,000.00
    b. ALTERNATIVE - Propose substituting cam lock switches in place of specified company switches - $34,000.00
    c. ALTERNATIVE - Propose using aluminum feeder conductors for circuits 60 amps and higher with the same ampacities of the specified copper conductors - $35,000.00
        i. Question from Brook McIlroy from April 22 re Aluminum conductors vs Copper conductors.
            1. Answer from our Electrical Sub: ***I allowed to upsize cables in aluminum to carry the same ampacity. Where #6CU was called out, I allowed for #4AL. Where #3CU was called out, I allowed for #1AL. The service conductors were called out to be 500MCM CU, (which is good for 380 amps) and I allowed for parallel runs of 250 MCM AL, which is good for 410 amps.***
    d. ALTERNATIVE - Propose alternate speaker Bose Professional Package and change the Cat6A cables to Cat6 - $21,000.00
        i. Question from Brook McIlroy from April 22 re which Bose system is being proposed.
            1. Answer from our Electrical Sub: We are proposing:
                a. ***BOSE PROFESSIONAL MA12EX PANARAY MODULAR COLUMNAR ARRAY LOUDSPEAKER TO REPLACE RENKUS HEINZ MODELS ICX7 (QTY 4) AND ICL-FR-DUAL (QTY 3).***

940 Second Line West
Sault Ste. Marie, Ontario, P6C 2L3
Phone: 705-759-4800 Toll Free: 800-461-0525
Facsimile: 705-759-6775
Email: info@averyconstruction.ca
www.averyconstruction.ca

   b. ***BOSE PROFESSIONAL FREESPACE 360P LOUDSPEAKER GREEN TO REPLACE INGROUND SPEAKERS E6T (QTY 6).***
   c. ***See attached product specs.***

e. ALTERNATIVE - Use round steel poles instead of tapered aluminum poles - $5,000.00
f. ALTERNATIVE - Change LT-01, LT-02 and LT-03 to a wireless control system - $19,500.00
   i. Lights remain as specified, just proposing to change how they are controlled.
   ii. Substitute for a less costly DMX controller from Acclaim Lighting
   iii. This alternative requires far fewer DMX cables
   iv. Question from Brook McIlroy from April 22 re wireless controller.
      1. *Electrical Contractor to confirm feasibility to revise LT-03 to wireless control system.*
         a. **Nothing is changing with the fixtures for LT-01, LT-02 and LT-03. We are proposing to eliminate the DMX cabling between the poles and the controller and provide the ARIA Wireless DMX Controllers that will communicate with the LT-01, 02 and 03 wirelessly. The new design for the DMX control system would be for the four poles only for the skating rink. All fixtures would be wireless DMX including LT-02, it would receive wireless DMX from LT-01. All other LT-03 fixtures unless within range of wireless DMX would be set levels at fixture at ON/OFF only with relay power control system - not controlled by DMX control system.**
      2. *Electrical Contractor to provide proposed wireless control specification for review.*
         a. **See spec within this package.**
      3. *IT Consultant to provide proposed wireless control specification to ensure the system is meeting the design requirements. Please note that the wireless system was not included and therefore the alternative shall also be reviewed by the IT consultant to see if it is also a cost-saving for them. The current system needs ethernet network for the below wireless DMX controller to communicate with its light fixtures. This network is not part of the "wireless dmx controller plus programming", and should be designed by IT consultant. IT consultant shall provide design such that ethernet is available where the wireless controller and its light fixtures are installed.*
         a. **We assume that this is the client's IT Consultant. Our lighting supplier is telling us that this wireless option is comparable to the original design.**
g. Total savings from the electrical scope - Confirmed April 27 - $116,500.00

4. Metals Alternatives - Division 05

a. ALTERNATIVE - Railing Alternative Option #2 - Supply, Fabrication, and Installation of 1 ¼" diameter exterior handrail, complete with top and mid-rails, and posts spaced at 1200mm, as an alternative to the stainless-steel handrails as detailed in the tender package. Consists of the above-noted railing with posts embedded into cored concrete, inclusive of epoxy paint coating - $7,020.00
b. Total savings from the metals scope for handrail alternatives - Confirmed April 22 - $7,020.00
c. ALTERNATIVE - Structural Steel Option - Beam Construction as an alternative to the open web steel joists - $7,320.00
d. Total savings from the structural steel scope - Confirmed April 22 - $7,320.00.

AVERY
Construction Limited & Transportation Services

940 Second Line West
Sault Ste. Marie, Ontario, P6C 2L3
Phone: 705-759-4800 *Toll Free:* 800-461-0525
Facsimile: 705-759-6775
Email: info@averyconstruction.ca
www.averyconstruction.ca

1. **Total Savings confirmed (April 27) for Downtown Plaza as per above - $197,369.00**

Sincerely,

Adam Lyons

Adam Lyons
Avery Construction

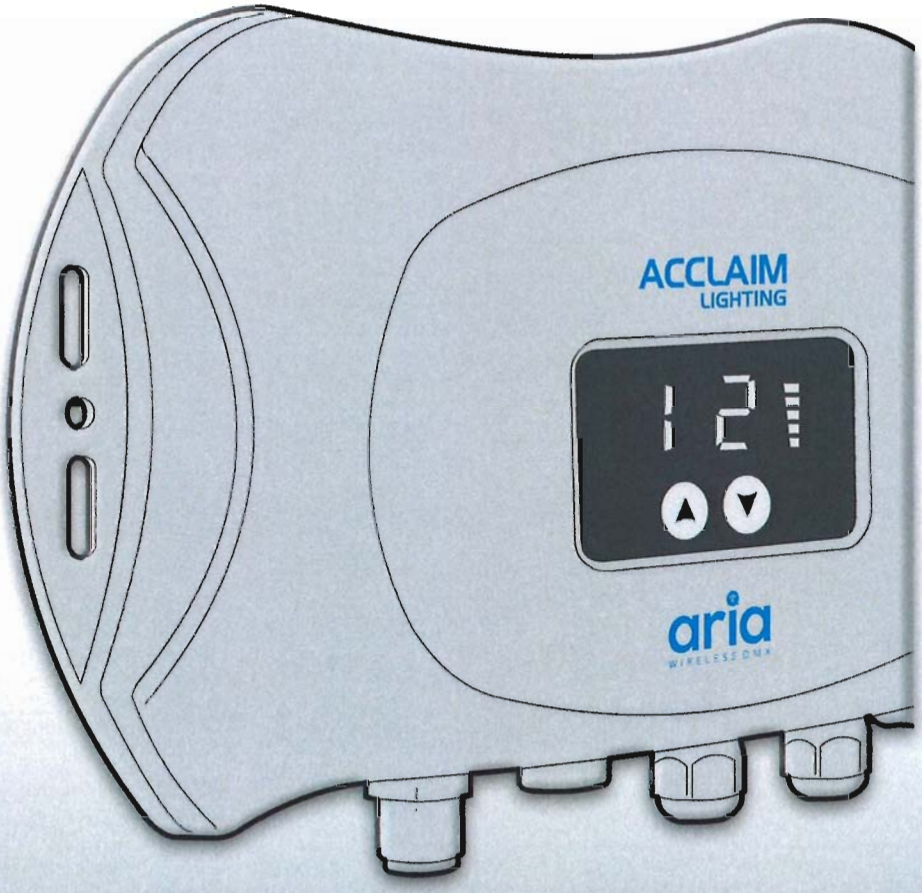
Tender Value - Original	$	8,791,900.31

Savings Scope Removals		
Savings Alternative Price	$	8,834.00
Roof Deck Alternative	$	47,695.00
CIP Savings	$	10,000.00
Electrical Savings	$	116,500.00
Steel Speed Savings	$	14,340.00
Total Savings	$	197,369.00

Item	Value		Tender Revised Value	
Add Alternate Pricing 1	$	13,211.00	$ 8,805,111.31	
Add Alternate Pricing 3			$ 8,805,111.31	
Add Alternate Pricing 4	$	(22,045.00)	$ 8,783,066.31	
Subtotal Revised Tender			$ 8,783,066.31	
Add Savings Scope Removal	$	-	$ 8,783,066.31	
Add Roof Deck Alternate	$	(47,695.00)	$ 8,735,371.31	
Add CIP Savings	$	(10,000.00)	$ 8,725,371.31	
Add Electrical Savings	$	(116,500.00)	$ 8,608,871.31	
Add Metals Savings	$	(14,340.00)	$ 8,594,531.31	
Total Revised Tender	**$**	**(197,369.00)**	**$ 8,594,531.31**	27-Apr
Original Tender			$ 8,791,900.31	
VM Total			$ 197,369.00	

Proposed Wireless Controller

ACCLAIM
LIGHTING



Aria Wireless DMX

User guide

CONTENTS

INTRODUCTION 2
Welcome 2
Safety, maintenance and cleaning 2

INSTALLATION 3
Choosing the right location 3
Mounting 4
Connections 5
Power and control wiring 6
Using Aria with OLS 6

OPERATION 7
The control panel 8
Signal strength 8
Choosing a channel 8
Transferring multiple universes 9
Using optional Aria Range Extenders 10
Extending range 10
Boosting signals in hard to reach areas 11
Transmitter must have later firmware 12
Using multiple Aria Range Extenders 13
Optimizing signal strength via channel selection 14
Interference created by objects 15
High gain antenna 15

FURTHER INFORMATION 16
Aria specifications 16
Dimensions 17
Limited product warranty 18

INTRODUCTION

WELCOME

Welcome to the Aria Wireless DMX system from Acclaim Lighting. Aria transceivers enable you to transfer DMX signals up to 2600 feet (792m) line of sight between units (obstacles between the respective antennas will lower the achievable distances). A 5dB onmi-directional antenna is supplied with each Aria unit, together with a 9 feet (3m) extension plus a male-to-male adapter.

Each Aria unit can operate as a transmitter or a receiver, depending on which is fed with a cabled DMX input. Fifteen radio channels are available to choose from, allowing you to avoid potential interference sources, such as WiFi access points, and set up parallel wireless links between different sets of Aria units. All Aria wireless signals are AES 128 bit encrypted.

Numerous Acclaim Lighting products, such as the Dyna Drum range, have compatible Aria wireless units built in, which allows a single Aria transmitter to control them directly.

Each Aria module can operate from mains inputs ranging from 100 to 277VAC, 50/60Hz (autosensing) and consume just 3W.

The Aria module housing is a gray power-coated die-cast aluminum enclosure with an IP66 outdoor rating, excluding the feed end connections, which must be housed appropriately. The unit is designed to be wall mounted and includes an antenna that is similarly intended for wall mounting (or direct attachment to the Aria unit using the supplied adapter).

SAFETY

- Ensure that the power input is supplied from a correctly fused, earthed and environmentally protected location.

MAINTENANCE

CAUTION: Always isolate mains power before starting maintenance operations.

- Ensure that all mounting (and device) screws/bolts are fully tight and free of corrosion.
- Ensure there is no deformation to the housing, lenses or fixing points.
- Check that all power supply cables are free from physical damage or material fatigue.
- Use only genuine spare parts supplied by Acclaim Lighting.

CLEANING

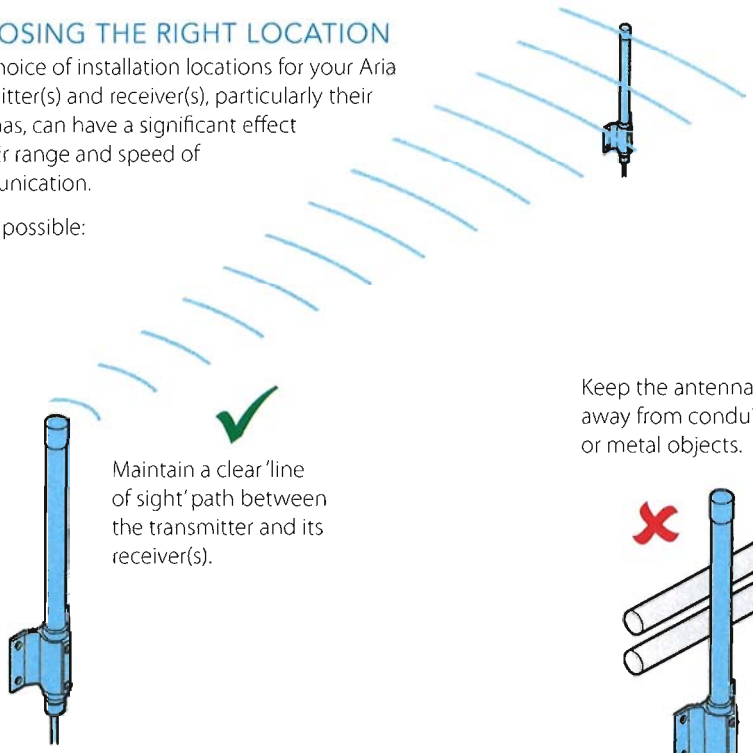
- Use a moist, lint-free cloth when cleaning each fixture.
- Never use alcohol or solvents.

INSTALLATION

CHOOSING THE RIGHT LOCATION

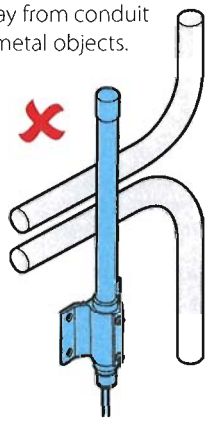
Your choice of installation locations for your Aria transmitter(s) and receiver(s), particularly their antennas, can have a significant effect on their range and speed of communication.

Where possible:

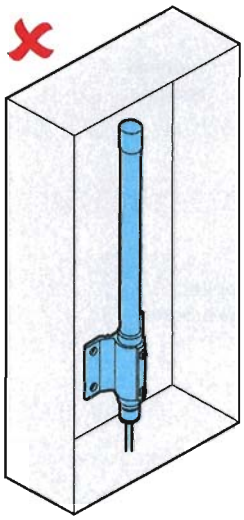


Maintain a clear 'line of sight' path between the transmitter and its receiver(s).

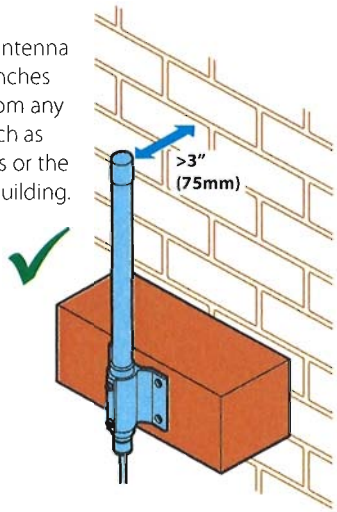
Keep the antenna away from conduit or metal objects.



Do not install an antenna inside a metal box.

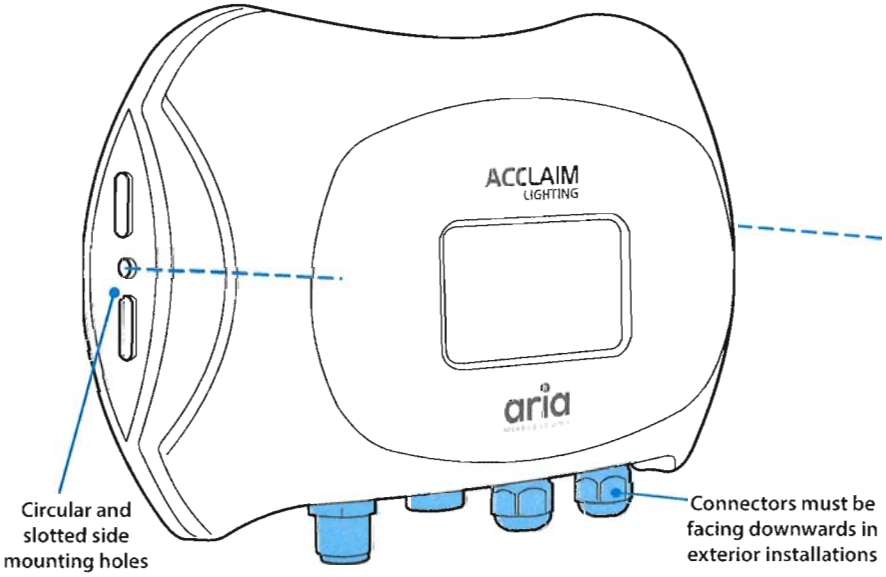


Keep the antenna at least 3 inches (75mm) from any surface such as walls, poles or the eves of a building.



MOUNTING

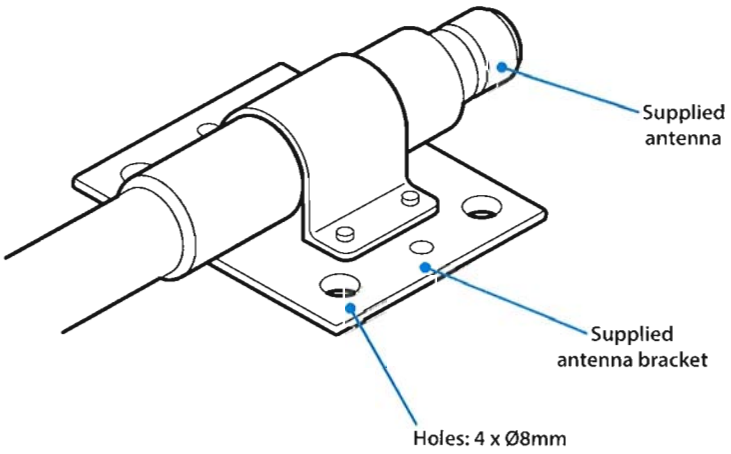
IMPORTANT: When installing outdoors, the Aria module must be wall mounted with its connectors facing downwards to ensure that full ingress protection is achieved.



Circular (Ø5mm) and slotted holes are located on each side for mounting purposes - for dimensions, see page 17.

See "Choosing the right location" on page 3.

The supplied antenna can be mounted directly onto the connector or fitted into its own wall bracket (supplied) - for dimensions, see page 17.



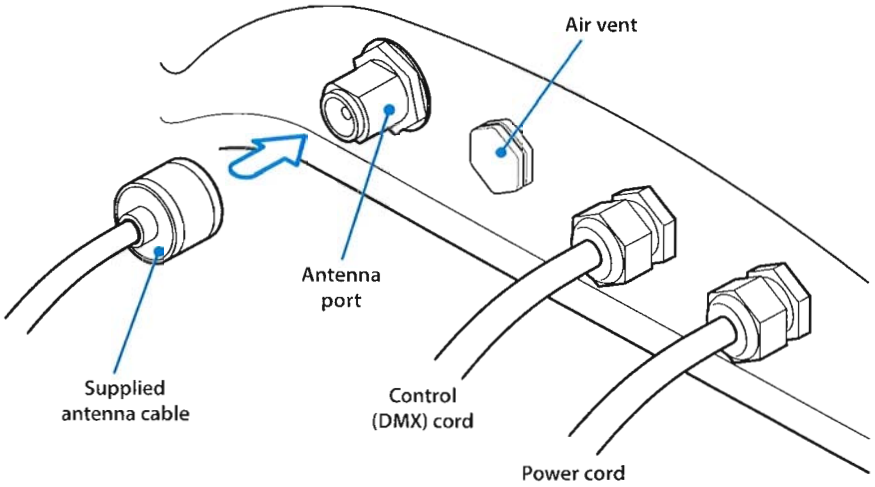
CONNECTIONS

On the underside face of the Aria unit, there are two fixed cords (DMX and power) via sealed glands as well as a moisture-proof air vent and the antenna port.

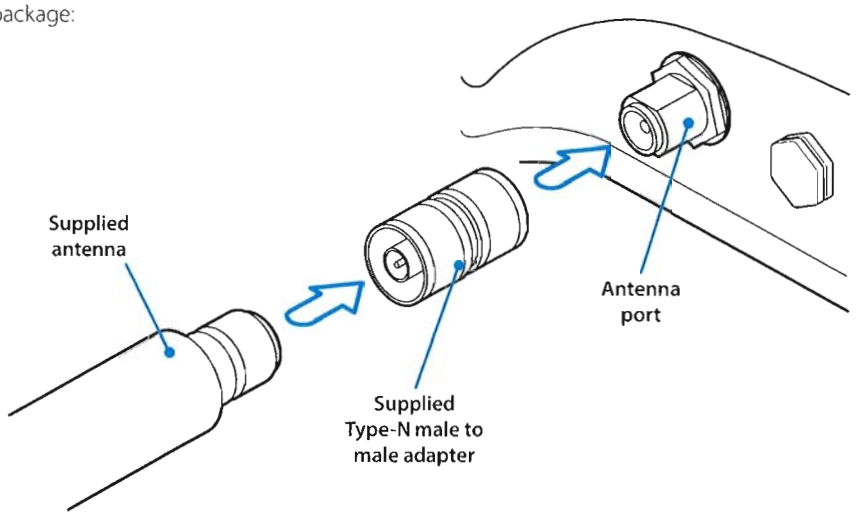
ANTENNA CONNECTION

Wherever possible, ensure the antenna has a clear path to that of the paired Aria unit(s). Be aware of the possibilities for interference caused by nearby WiFi access points - see page 14. See also "Choosing the right location" on page 3.

The supplied antenna can be wall mounted and then connected to the port on the underside of the Aria unit using the supplied cable (9.8 feet, 3m):



Alternatively, the antenna can be attached directly to the port on the Aria underside, so that it hangs vertically downwards (the antenna bracket should be removed when using this method). This requires you to use the Type-N male to male adapter supplied within the package:

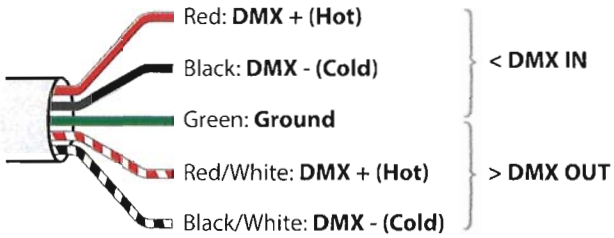


POWER AND CONTROL WIRING

The power and DMX cords enter the casing via water-tight glands on the underside of the Aria unit. Both cords are supplied as bare tails.

CONTROL

The control cord is roughly 5.2 feet (1.6m) in length and has five cores to provide DMX512-A input and output connections:

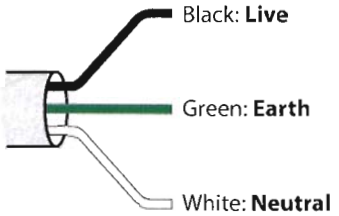


POWER

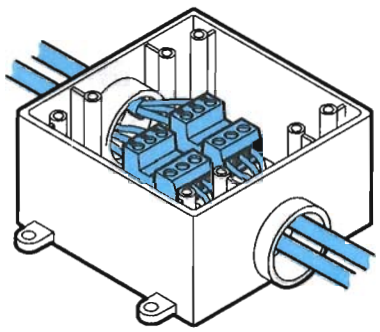
The power cord is roughly 4.5 feet (1.4m) in length. The power requirements are as follows:

- Voltage: 100-277VAC 50/60Hz (autosensing)
- Power: 3W

The power cord color designations are as follows:



Where necessary, use one (or two) weatherproof junction boxes with suitable IP ratings, seals and connectors to protect the power and DMX cord joints.



Connections to feed cables are best protected within junction boxes with suitable IP ratings

USING ARIA WITH OLS

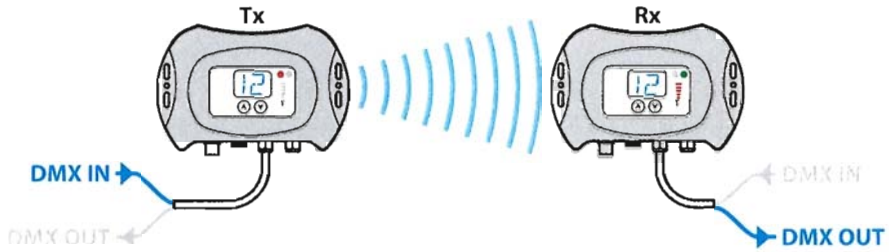
When using an Aria-equipped lighting fixture together with the Acclaim Lighting OLS cabling system and other fixtures, place the Aria-equipped fixture as the first in the line and it will automatically pass the received DMX signal along the OLS links.

OPERATION

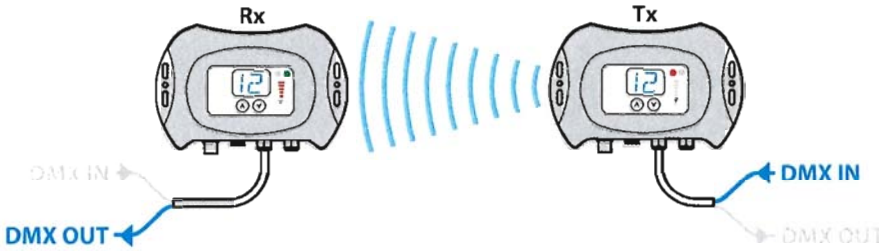
Providing transceiver pairs are within range and are set to use the same radio channel, setup and operation will be totally transparent. A DMX signal applied to one unit will be replicated and output at the other.

Note: Remote Device Management (RDM) is not currently supported across Aria wireless links.

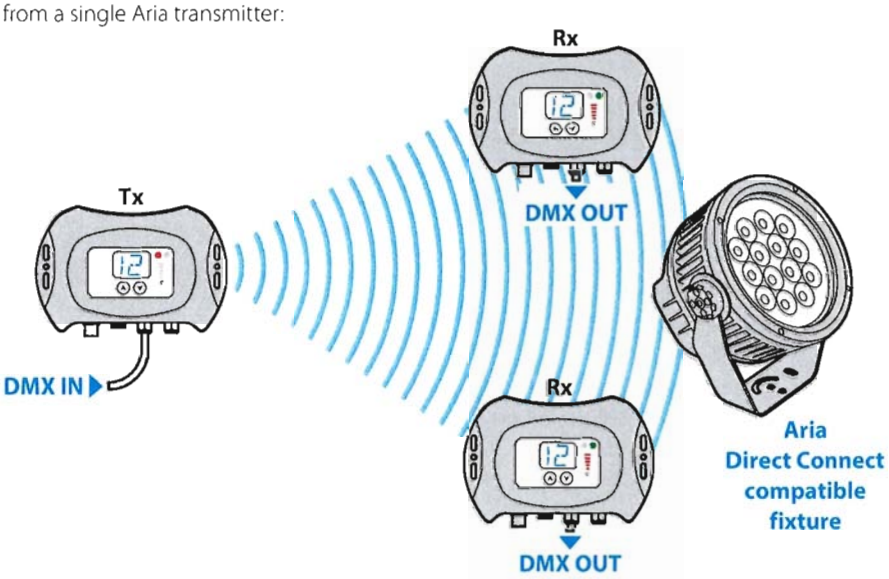
Aria units can operate either as a transmitter or as a receiver - although not at the same time:



No configuration changes are required to change between operation as a transmitter or receiver; the detection of a valid DMX input will automatically prompt an Aria unit to become a transmitter.



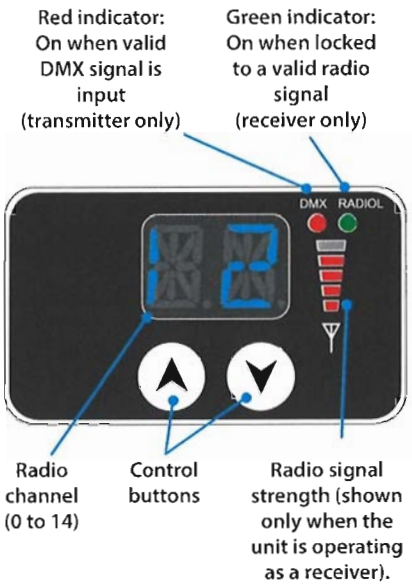
Up to 250 Aria units (or Aria Direct Connect compatible lighting fixtures) can act as receivers from a single Aria transmitter:



THE CONTROL PANEL

The control panel allows you to choose the radio channel and it also indicates both the signal strength plus the DMX status.

The two digit display automatically blacks out (and locks) roughly twelve seconds after your last button press.



SIGNAL STRENGTH

The radio signal strength is shown on Aria units when they are in receive mode; varying from zero to five red bars.

If the signal strength reduces to two bars or less, operation will become affected and you may need to take action to remedy the situation:

- Ensure that the line of sight between transceivers is as clear as possible.
- If possible, reposition the antenna(s) or move the transmitter closer to the receiver(s).
- If possible, perform a radio survey to determine possible causes of interference. Using different Aria radio channels may improve reception in the presence of other radio sources, such as WiFi devices. See page 14.
- To cover long distances, consider using a range extender. See page 10.

CHOOSING A CHANNEL

TO UNLOCK AND CHOOSE A RADIO CHANNEL

1 Simultaneously press and hold the ▲ and ▼ buttons. The current radio channel will be shown and then after roughly seven seconds the unit will unlock to allow you to change the radio channel, as required.

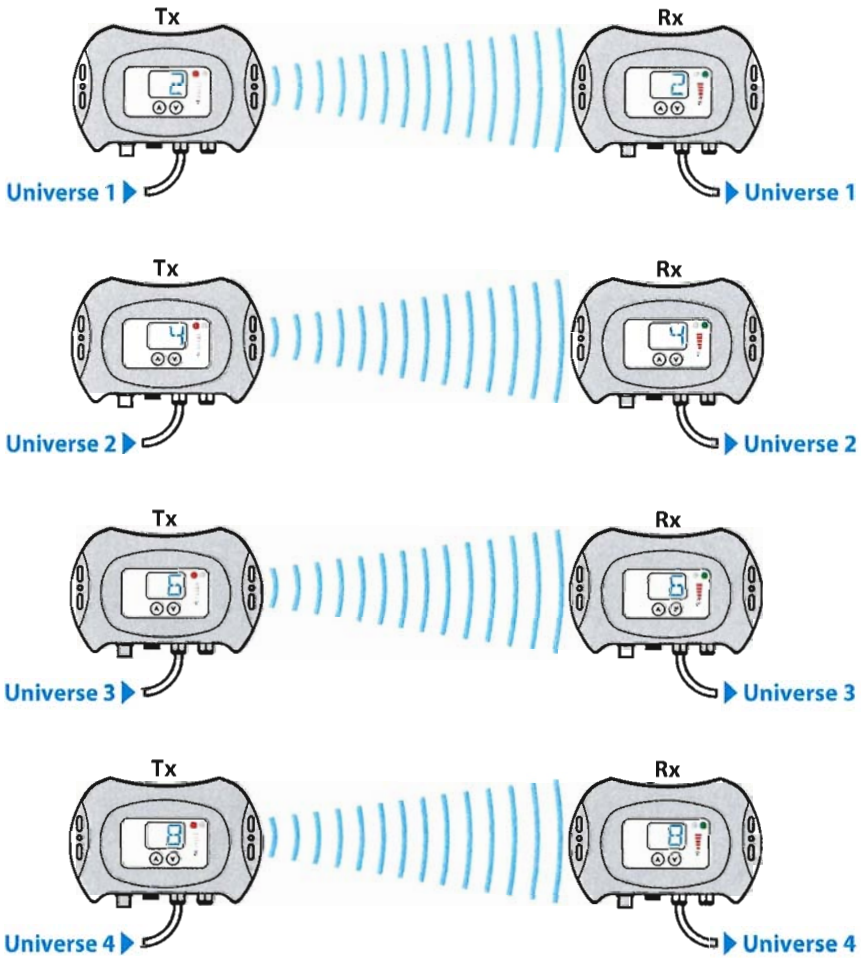
2 Use the ▲ and ▼ buttons to increment or decrement the radio channel (between 0 and 14) on each Aria unit. See page 14 for channel details.

Notes: If more than one pair of Aria units are used in the same area, maintain a gap of at least one radio channel between pairs, see page 9. There must never be two transmitters using the same radio channel in the same area.

The panel will lock again (to prevent the channel being changed accidentally) roughly twelve seconds after the last button press.

TRANSFERRING MULTIPLE UNIVERSES

Each Aria transceiver pair can transfer a single DMX universe, however, by arranging parallel pairs of Aria units you can send multiple universes. Configuration for each pair is exactly the same as any standard installation, see page 8.



The two important points to remember when setting up multiple Aria pairs are:

- Ensure there is a minimum spacing of 6.5 feet (2m) between the antennas of neighboring Aria units.
- Maintain a gap of at least one Aria radio channel between different pairs operating in the same area, e.g. use groups of odd or even channels: *0, 2, 4, 6, 8, 10, 12 and 14* **OR** *1, 3, 5, 7, 9, 11 and 13*. This means the maximum number of universes that can be transferred in the same area is 8 (where external sources of interference do not exist). See page 14 for details about WiFi issues.

Taking these steps will help to minimize interference between Aria units operating in the same area.

USING OPTIONAL ARIA RANGE EXTENDERS

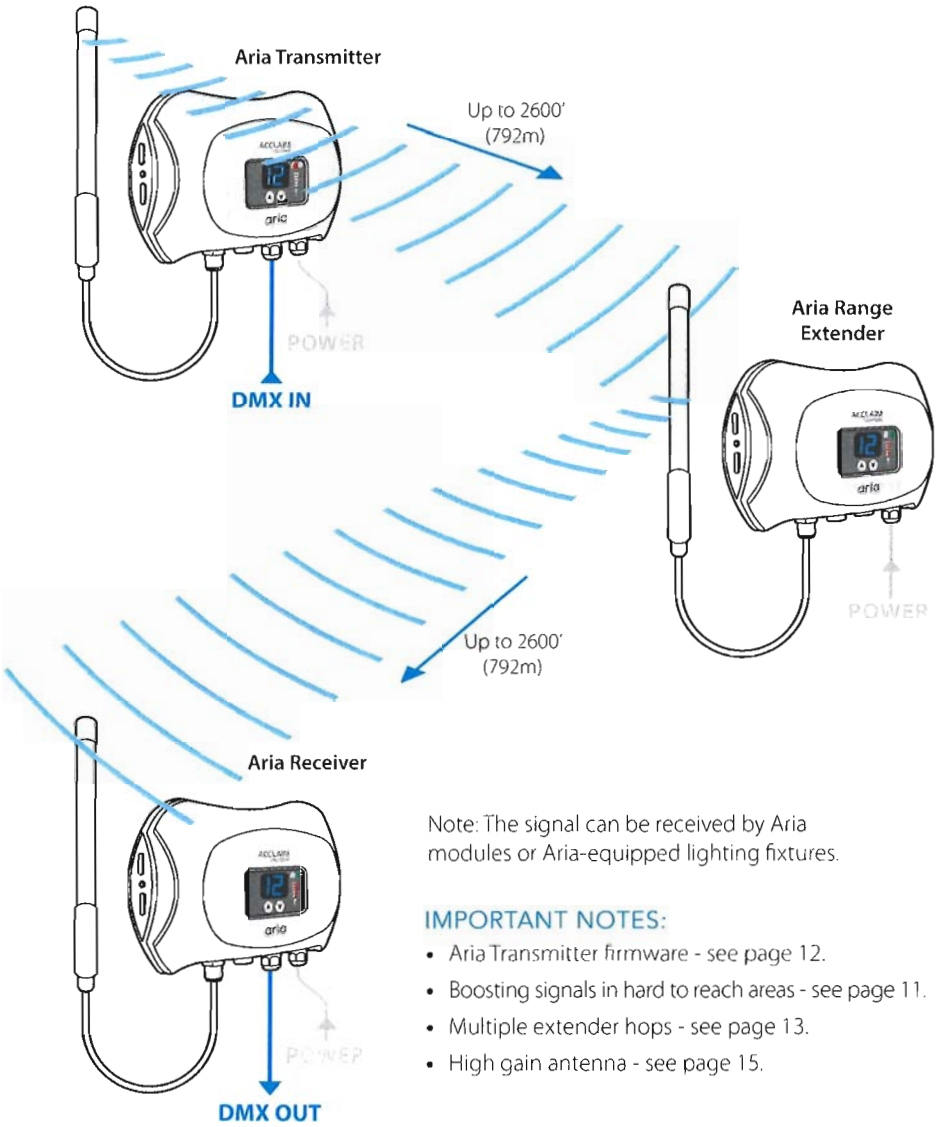
Range Extenders are modified Aria modules which can receive and transmit simultaneously - passing on and boosting the Aria signals that they detect. They can be used in different ways.

EXTENDING RANGE

Position an optional Aria Range Extender between the Aria Transmitter and the Aria Receiver so that it is within range of both:

- Line of sight: 2600' (792m)
- When obstructed: 300' (91m)

Ensure that the transmitter, receiver and range extender are all set to the same radio channel. The Aria Range Extender will receive the original signal, amplify it and re-transmit it.



Note: The signal can be received by Aria modules or Aria-equipped lighting fixtures.

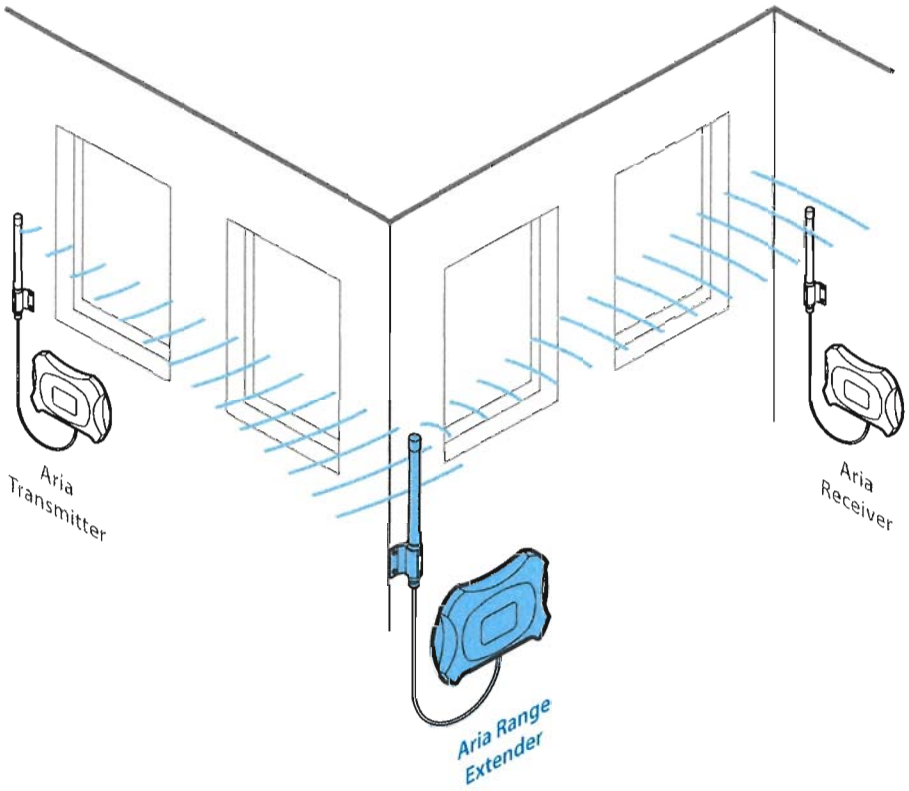
IMPORTANT NOTES:

- Aria Transmitter firmware - see page 12.
- Boosting signals in hard to reach areas - see page 11.
- Multiple extender hops - see page 13.
- High gain antenna - see page 15.

BOOSTING SIGNALS IN HARD TO REACH AREAS

Aria Range Extenders have an important role to play in situations where signals are affected by the hard-to-reach placement of the transmitter and/or receiver, rather than the excessive distance between them.

Position the Aria Range Extender between the Aria Transmitter and the Aria Receiver such that it is visible to both. If necessary, use more than one Aria Range Extender (see page 11) to form a reliable chain between the start and end points:



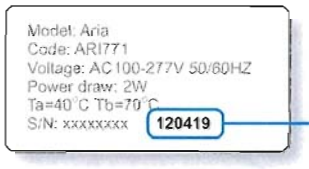
Ensure that the transmitter, receiver and range extender are all set to the same radio channel. The Aria Range Extender will receive the original signal, amplify it and re-transmit it.

IMPORTANT NOTES:

- Aria Transmitter firmware - see page 12.
- Extending range - see page 10.
- Multiple extender hops - see page 13.
- High gain antenna - see page 15.

TRANSMITTER MUST HAVE LATER FIRMWARE

In order to operate, Aria Range Extenders must be given permission, by the Aria Transmitter, to repeat the signal. This is a function that has been added to the signal output of all standard Aria modules manufactured since December 2019. On the rear of each Aria module you will find a label:



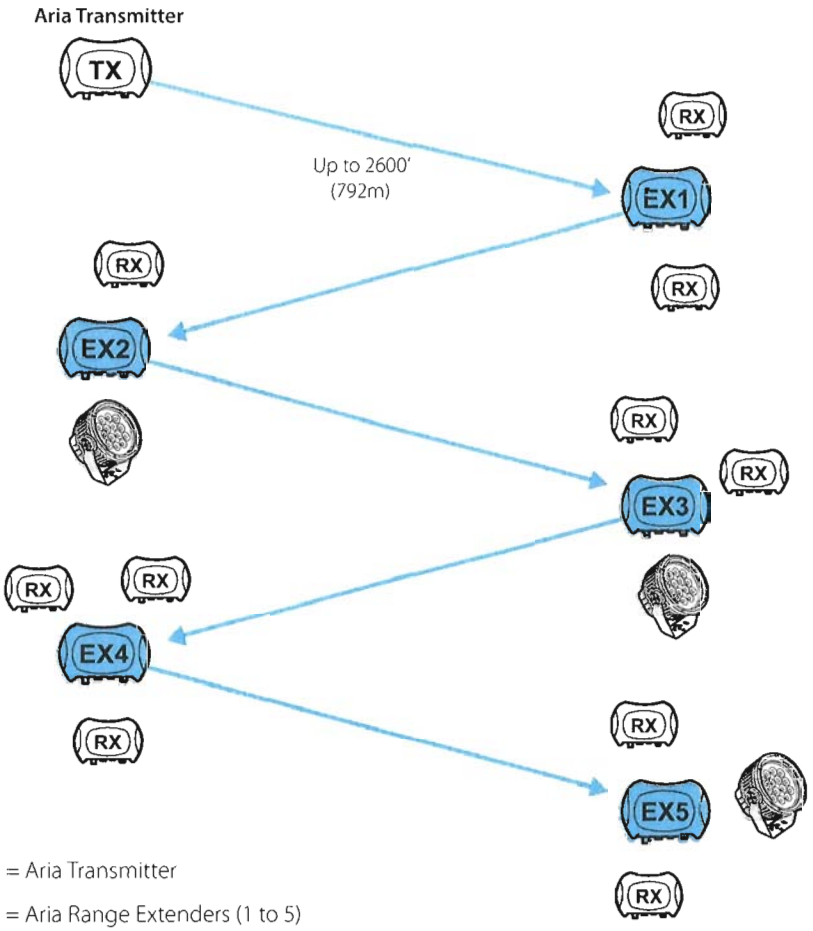
Date of manufacture, in the format: **mmddyy**

If an Aria module has a manufacture date earlier than December 2019 you will need to either swap it for a later model or return it to Acclaim Lighting for a firmware upgrade before it can be successfully used to transmit to an Aria Range Extender.

The Aria modules being used as receivers do not require the later firmware.

USING MULTIPLE ARIA RANGE EXTENDERS

Up to five Aria Range Extenders can be used together, with each passing the signal on to the next. This allows larger distances to be covered and the reliable delivery of the signal to a wide span of receivers (and/or Aria-equipped fixtures) at every stage.



KEY

- = Aria Transmitter
- = Aria Range Extenders (1 to 5)
- = Aria Receivers
- = Aria-equipped lighting fixtures

Ensure that the transmitter, receiver and all range extenders are all set to the same radio channel. Each Aria Range Extender will receive the original signal, amplify it and re-transmit it.

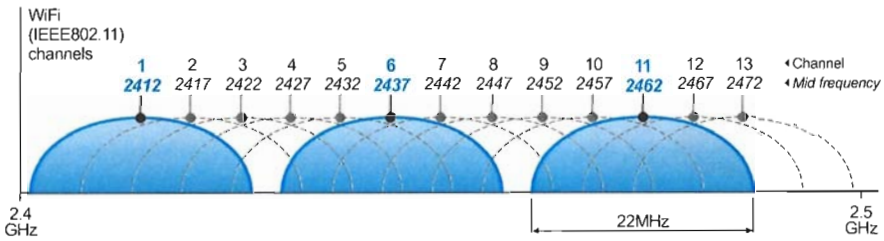
IMPORTANT NOTES:

- Aria Transmitter firmware - see page 12.
- Extending range - see page 10.
- Boosting signals in hard to reach areas - see page 11.
- High gain antenna - see page 15.

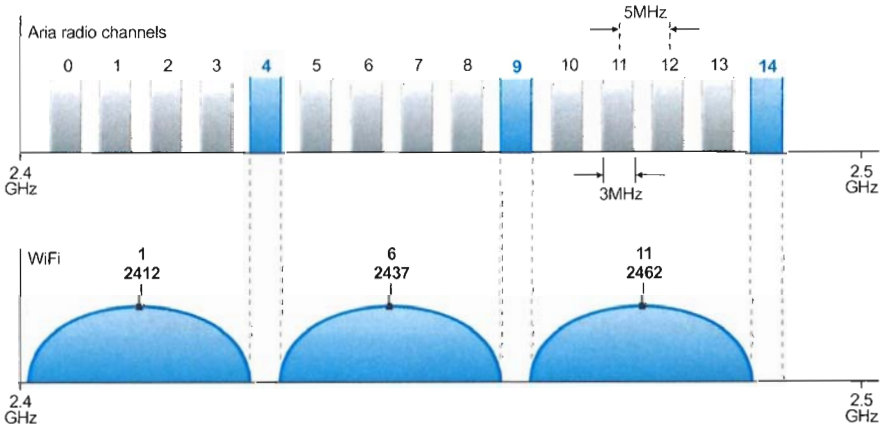
OPTIMIZING SIGNAL STRENGTH VIA CHANNEL SELECTION

Aria wireless transceivers use radio frequencies contained within the Industrial Scientific and Medical (ISM) band that runs between 2.4GHz and 2.5GHz. As one of the few license-free radio bands agreed upon in most countries, many other devices also use this band, most notably WiFi. Aria units use the ISM band in a different manner than WiFi and the two can coexist. However, where distances between Aria units are great and WiFi access points are reasonably close, then interference can become an issue.

WiFi uses the IEEE802.11 standard, which divides the ISM band into 13 (sometimes 14) channels, each of which is 22MHz wide. However, the channels overlap and so cannot all be used simultaneously. Hence, most WiFi access points settle upon channels 1, 6 and 11 to avoid any overlap:



Aria uses the IEEE802.15.4 standard, with channels that are 3MHz in width and not overlapping. Many Aria channels do, however, coincide with the common WiFi channels. The notable exceptions are Aria channels 4, 9 and 14, which fall into the gaps between the most commonly used WiFi channels:



Where interference is suspected, a radio frequency survey may provide useful indications. If you have control over the nearest WiFi access points, it is suggested that you lock them down to one or more of the common channels (to prevent them from roaming) and select Aria channels that sit comfortably alongside.

Note: The Aria channel notations (0 to 14) are directly equivalent to the IEEE802.15.4 channels 11 to 25, inclusive.

INTERFERENCE CREATED BY OBJECTS

The composition of nearby objects can have a significant impact on the quality of the RF signal. Here are a few examples:

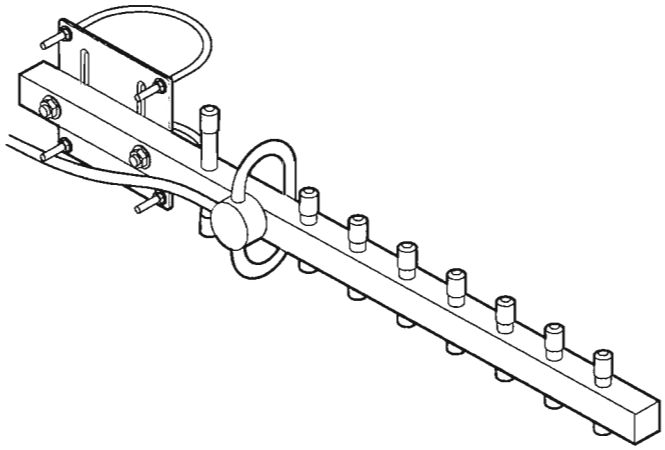
- Standard drywall does not present much of an issue to the 2.4GHz wireless spectrum. However, things inside or attached to the drywall, such as copper pipe, electrical conduit, and circuit breaker panels, will partially block RF signal propagation.
- Hollow cement block walls will dampen the RF signal.
- Reinforced concrete walls typically contain rebar that will contribute to significant RF signal strength loss.
- Large metal structures such as metal cabinets, HVAC units, machinery, brew kettles, etc. may partially or completely block the RF signal.

CHOOSING THE RIGHT LOCATION

Please see page 3 for tips about locating the transmitter and receiver.

HIGH GAIN ANTENNA

In locations where you wish to extend the range further or to otherwise strengthen the signal (eg to counter the threat of interference), Acclaim Lighting provide a directional antenna with 10dB gain [part #: ADA10].



FURTHER INFORMATION

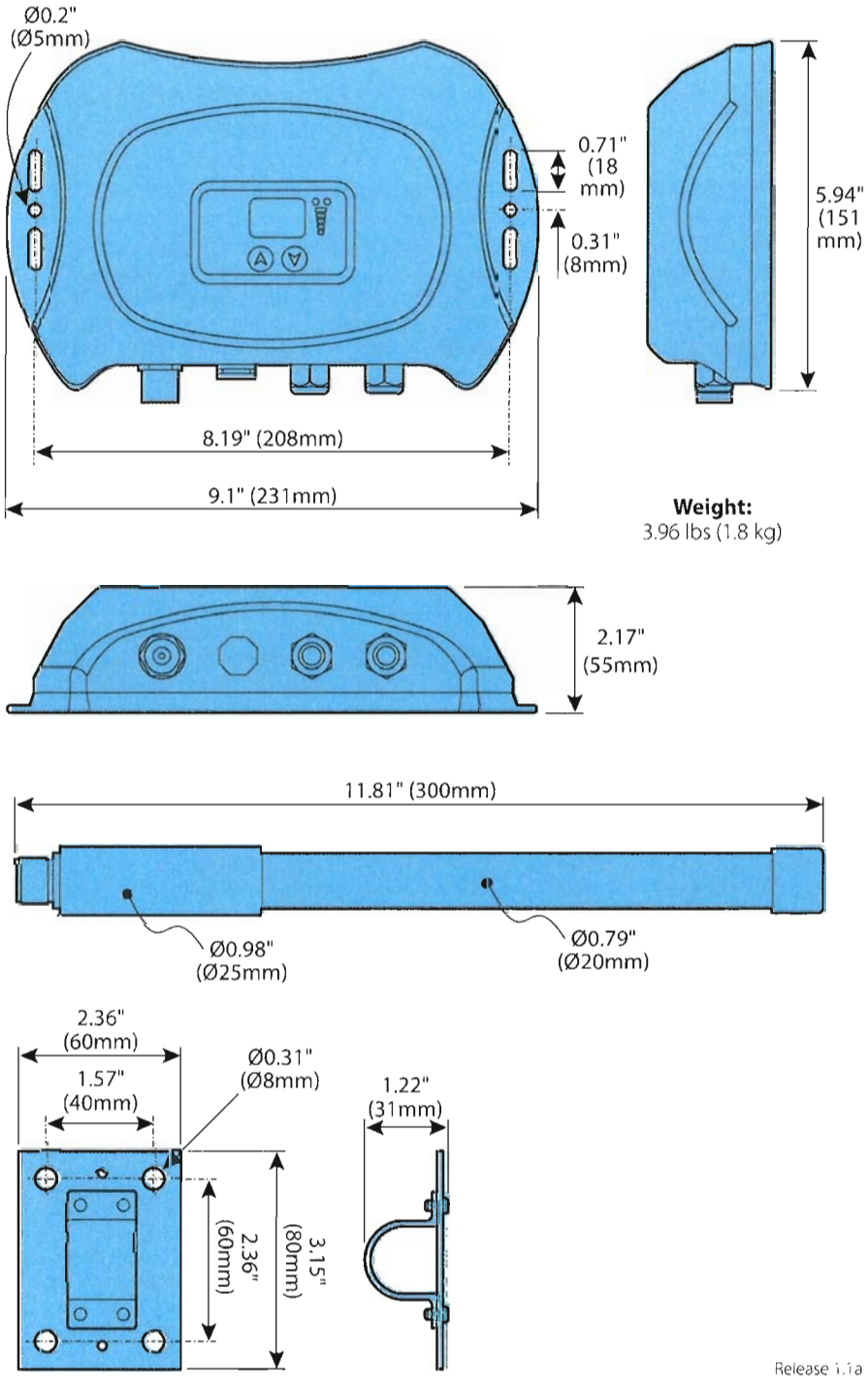
ARIA SPECIFICATIONS

Wireless protocol	2.4GHz, IEEE802.15.4	
Estimated transmission range	Clear line of sight: Through obstructions (walls, etc):	2600 feet (792m) 300 feet (91m)
Selectable channels	15	
DMX universes	One per transceiver set, maximum of 8 simultaneously	
Max number of receivers	250 (to ensure optimum data transmission)	
Signal encryption	AES 128	
Included antenna	5dB, includes direct attachment adaptor plus cable	
Mounting	Wall mountable via screw holes on transceiver and antenna mount	
Input voltage	100 to 277VAC (50/60Hz) - autosensing	
Input power consumption	3W	
Housing	Die cast aluminum with matte gray powder coat finish	
IP rating	IP66, wet location (not including cable end feeds)	
Operating temperature	-40°F to 122°F -40°C to 50°C	
Certifications		

NOTES

- To prevent signal interference with nearby fixtures and devices, only operate after the proper wireless channel and DMX address have been set. This product is only to be installed by trained and licensed professionals.
- This product can only be used with the wireless antenna model RF-AN2400L-3DBi, by RongFengDa Communications.
- This product is not intended for retail sale.
- This product is designed to be used in commercial applications, and is not suitable for retail consumers.

DIMENSIONS



Release 1.1a

LIMITED PRODUCT WARRANTY

A. Acclaim Lighting™ hereby warrants, to the original purchaser, Acclaim Lighting finished products to be free of manufacturing defects in material and workmanship for a standard period of:

- Fixtures: 5 Years (1,825 days) from the date of purchase.
- Drivers, power supplies and accessories: 5 Years (1,825 days) from the date of purchase.
- Flex Products: 3 Years (1,095 days) from the date of purchase.
- Controllers: 2 Years (730 days) from the date of purchase.

It is the owner's responsibility to establish the date and place of purchase and warranty terms by acceptable evidence, at the time service is sought.

B. For warranty service, send the product only to the Acclaim factory. All shipping charges must be pre-paid. If the requested repairs or service (including parts replacement) are within the terms of this warranty, Acclaim Lighting will pay return shipping charges only to a designated point within the United States. If the entire instrument is sent, it must be shipped in its original package. No accessories should be shipped with the product. If any accessories are shipped with the product, Acclaim Lighting shall have no liability whatsoever for loss of or damage to any such accessories, nor for the safe return there of. Acclaim reserves the right to replace the item with same or similar product at its discretion.

C. This warranty is void if the serial number has been altered or removed; if the product is modified in any manner which Acclaim concludes, after inspection, affects the reliability of the product; if the product has been repaired or serviced by anyone other than the Acclaim Lighting factory unless prior written authorization was issued to purchaser by Acclaim Lighting; if the product is damaged because not properly maintained as set forth in the instruction manual.

D. This is not a service contract, and this warranty does not include maintenance, cleaning or periodic check-up nor do we guarantee as part of this warranty any lumen performance during period. Parts not covered by this warranty include: fuses, external power supplies, third party items not manufactures by Acclaim lighting. During the period specified above, Acclaim Lighting will replace defective parts at its expense, and will absorb all expenses for warranty service and repair labor by reason of defects in material or workmanship. The sole responsibility of Acclaim Lighting under this warranty shall be limited to the repair of the product, or replacement thereof, including parts, at the sole discretion of Acclaim Lighting. At no time will installation or re-installation or products labor or liability costs will be assumed by Acclaim Lighting. All products covered by this warranty were manufactured after January 1, 2012, and bear identifying serial number marks to that effect.

E. Acclaim Lighting reserves the right to make changes in design and/or improvements upon its products without any obligation to include these changes in any products theretofore manufactured No warranty, whether expressed or implied, is given or made with respect to any accessory supplied with products describe above. Except to the extent prohibited by applicable law, all implied warranties made by Acclaim Lighting in connection with this product, including warranties of merchantability or fitness, are limited in duration to the warranty period set forth above. And no warranties, whether expressed or implied, including warranties of merchantability or fitness, shall apply to this product after said period has expired.

F. Marine or extreme weather location applications using Acclaim lighting products are subject to a 2 year limited warranty and Acclaim must be notified prior to delivery of units for such applications so that preventative treatment can be made to the products to ensure proper performance and product life with a special marine code coating / sealing process at an additional cost.

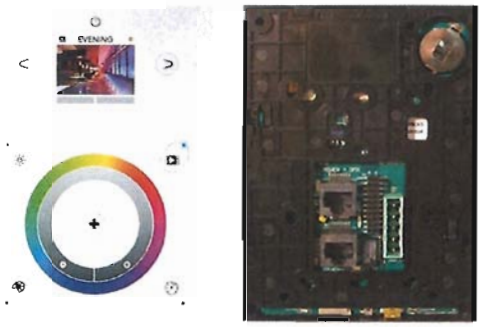
G. The consumer's and or dealer's sole remedy shall be such repair or replacement as is expressly provide above; and under no circumstances shall Acclaim Lighting be liable for any loss or damage, direct or consequential, arising out of the use of, or inability to use, this product. This warranty is the only written warranty applicable to Acclaim Lighting products and supersedes all prior warranties and written descriptions of warranty terms and conditions heretofore published.

www.acclaimlighting.com

ACCLAIM LIGHTING

ART 500

Client:	
Project:	
Type:	
Order Code:	
Quantity:	



The **Art 500** is a touch panel DMX Controller with 1,024 DMX channels and 500 programmable scenes, designed to be the most effective control solution for architectural control. Included is the ART 500 software package, which offers an easy to navigate interface, combined with powerful control features.

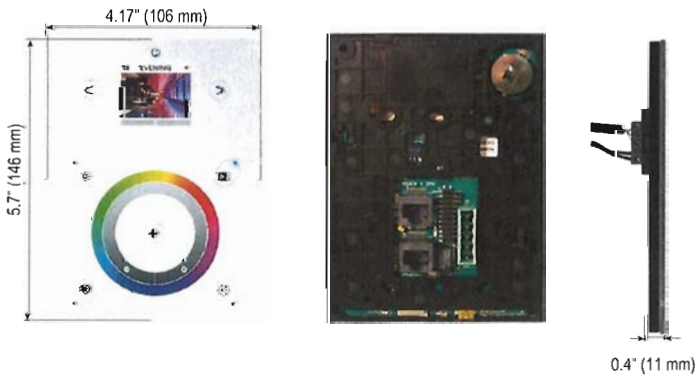
ORDER CODE

ART500

SPECIFICATIONS

Power Input	6V DC (Transformer Included) or POE
DMX Output	1024 DMX Channels, 2 Universes
Software OS Compatibility	Windows XP, Vista, 7, 8, 10 (ESA Pro), Mac OS X (ESA2)
Trigger Protocols	8 x Dry Contact Trigger, Calendar Trigger, RS-232, IR
Mounting	Single Gang Electrical Box (Not Included)
Housing	Glass Panel, Polycarbonate Body
Operating Temp	14°F to 113°F (-10°C to 45°C)
Connectors	Screw Terminal Blocks and RJ45, USB for PC / Mac Software
Storage	Micro SD Card
Warranty	2 Years
Weight & Rating	8.71 oz. (247g), Dry Location
Dimensions	W 5.7" x H 4.17" x D 0.4" (146 mm x 106 mm x 11 mm)
Certifications	ETL c us CE RoHS

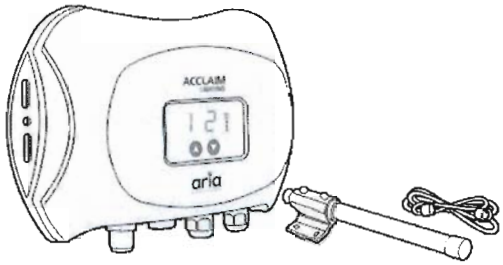
DIMENSIONS



V1.1
Specifications subject to change without notice.

aria™
WIRELESS DMX

ACCLAIM LIGHTING



Client:

Project:

Type:

Order Code:

Quantity:

The **Aria Wireless DMX system** is a compact, local, outdoor rated wireless DMX system. The Aria transceiver can act as either the sending or receiving point, and you can select up to 15 channels on the 2.4 GHz band. The internal wireless radio features both automatic networking and signal routing optimization to ensure the best possible reception of DMX data. A 5dB, omni-directional antenna is included, which provides transmission up to 2600' line of sight and 300' between obstructions and walls.

SPECIFICATIONS

Wireless Protocol	2.4 GHz, IEEE 802.15.4, 15 selectable channels
Estimated Transmission Distance	2600' (792m) line of sight, 300' (91m) between obstructions and walls
Data Encryption	AES 128-bit
DMX Universes	One per transceiver, maximum of 8 simultaneously
Max number of transceivers	Up to 250 (limited to ensure optimum data transmission)
Included Antenna	5dB, includes direct attachment adapter and 9' extension cable
Mounting	Wall mountable via screw holes on both the transceiver and antenna mount
Power Consumption	3W
Operating Voltage	100-240VAC, 277VAC - 50/60Hz
Display Features	Auto lockout and display blackout
Finish	Gray
Housing Material	Die cast aluminum
Ambient Operating Temperature	-40°F to 122°F (-40°C to 50°C)
IP Rating	IP66, Wet Location (does not include feed ends - install in an enclosure)
Wiring	3.28' (1m) Attached AC power feed cable and DMX in /out cable included
Warranty	5 Years Limited
Weight	3.96 lbs (1.8 kg)
Dimensions	W 9.1" x H 6.2" x L 2.2' (231.6 x 157.7 x 55mm)
Certifications	ETL US, CE, RoHS 2002/95/EC

Specifications subject to change without notice

aria™ WIRELESS DMX

ACCLAIM LIGHTING

ORDER CODES

*Indicates Special Order

Model

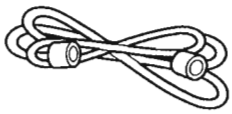
ARIA WDS

Direct connection with:
Dyna Drum HO
Dyna Drum SO
Dyna Drum EO
Dyna Accent
Dyna Accent Mini
UDM-W

INCLUDED COMPONENTS

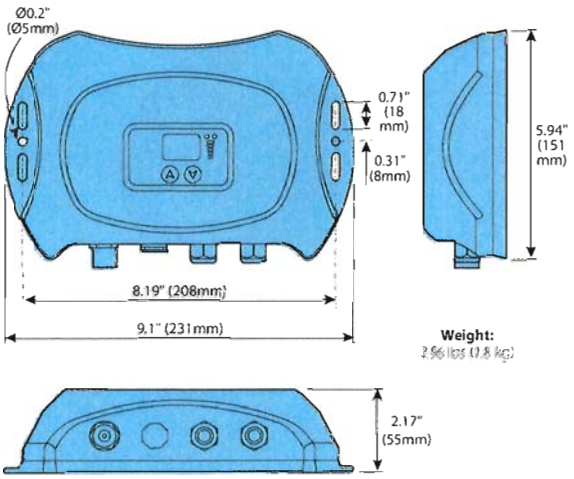
5 dB antenna
Type N Female Connector

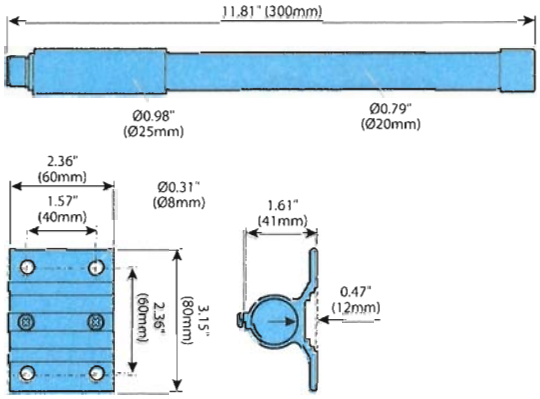
Type N Male to Male Adapter
Connects antenna directly to Aria without using the extension cable



9' (2.74m) Antenna Extension Cable & Bracket
To remotely mount the antenna

DIMENSIONS





Specifications subject to change without notice

Specification Sheet 2.1.3
www.acclaimlighting.com

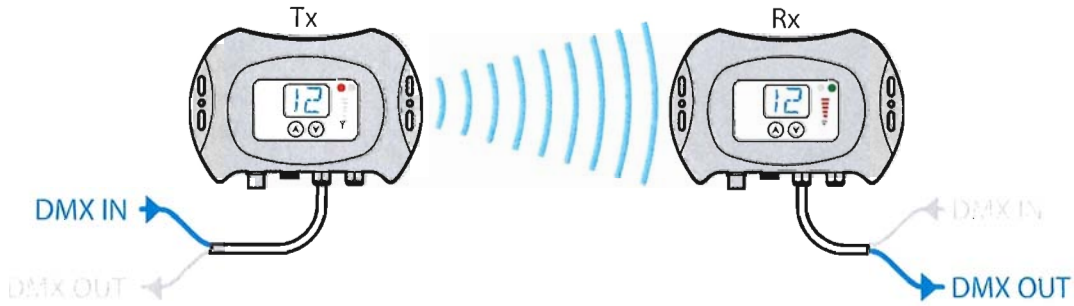
aria™ WIRELESS DMX

ACCLAIM LIGHTING

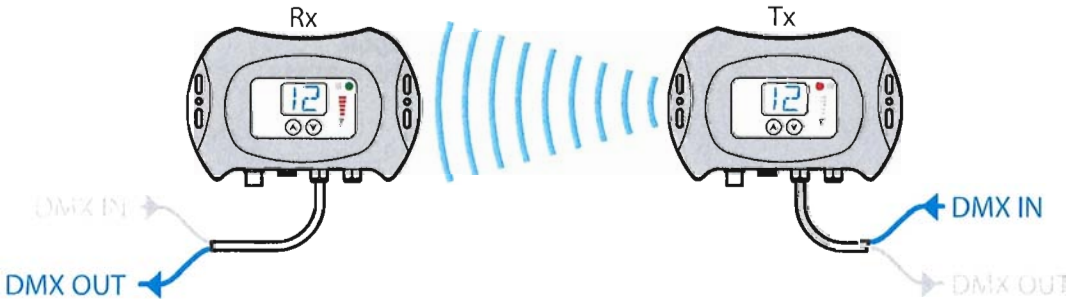
SYSTEM LAYOUT

Consult user guide for additional details

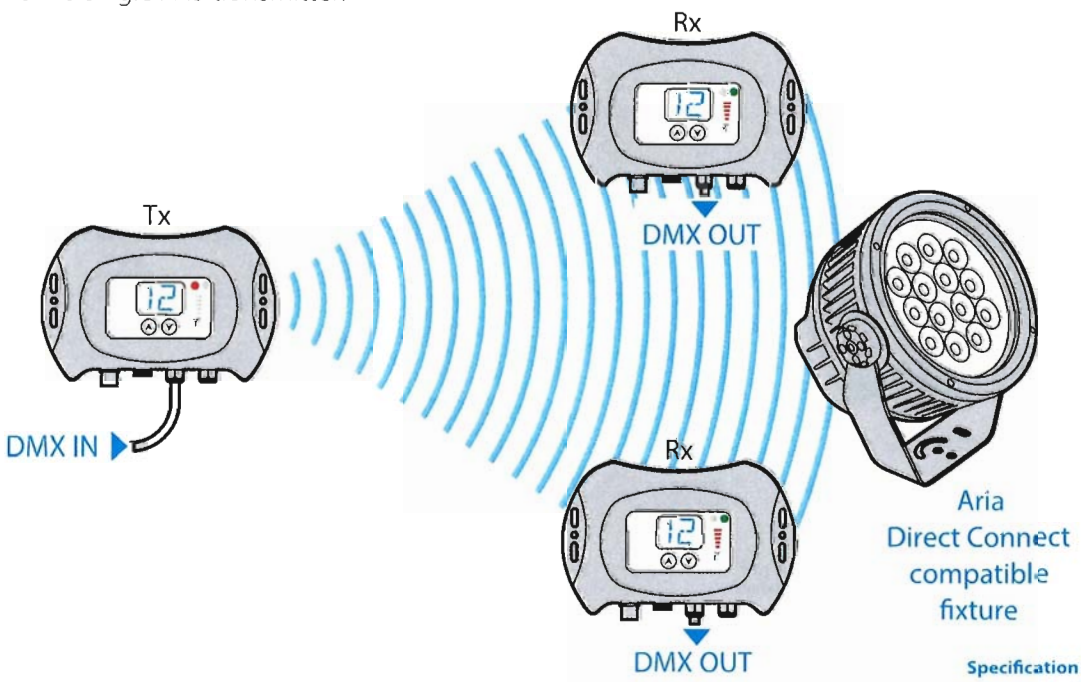
Aria units can operate either as a transmitter or as a receiver - although not at the same time:



No configuration changes are required to change between operation as a transmitter or receiver; the detection of a valid DMX input will automatically prompt an Aria unit to become a transmitter.



Up to 250 Aria units (or Aria Direct Connect compatible lighting fixtures) can act as receivers from a single Aria transmitter:



Proposed Bose Sound System

Panaray® MA12EX
full-range modular line array

BOSE®

TECHNICAL DATA SHEET

Key Features

- **Twelve 2.25" (64 mm)** full-range drivers mounted in a vertical line array deliver wide horizontal coverage with narrow vertical pattern control
- **Modular design** allows stacking of multiple enclosures in a line array configuration to provide increased vertical pattern control which improves "throw" distance and reduces unwanted floor/ceiling reflections
- **Articulated Array®** design provides wide 160° horizontal coverage with 20° nominal vertical coverage for a single module. Actual vertical coverage varies with number of modules in line array configuration
- **Frequency range down to 58 Hz** allows full-range speech and light music reinforcement without separate low-frequency loudspeakers. For extended bass and higher output levels, use with Bose MB4, MB12, or MB24 modular bass loudspeakers
- **Optional brackets** allow easy installation of single-, double- or triple-stack line array modules

Product Overview

The Bose® Panaray® MA12EX is a full-range modular line array loudspeaker designed to provide outstanding vocal intelligibility in acoustically demanding spaces. The slim column enclosure blends with almost any décor. The "EX" version adds an Articulated Array® design to provide wider 160° horizontal coverage and weather-resistant components to allow outdoor applications.

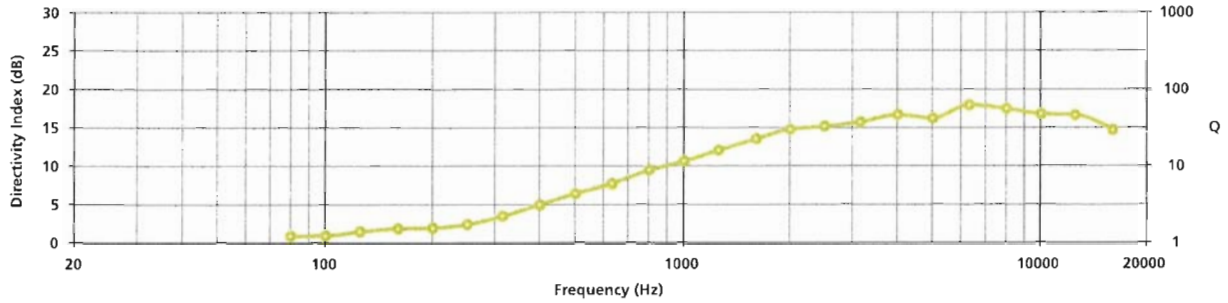
Technical Specifications

System Performance	
Frequency Response (+/-3 dB)[1]	75 Hz - 13 kHz
Frequency Range (-10 dB)[1]	58 Hz - 16 kHz
Nominal Dispersion[2]	160° H x 20° V
Recommended High-Pass Filter	65 Hz
Loudspeaker EQ	Required
Overload Protection	PTC / Lamp
Long-Term Power Handling[3, 4]	150 W (600 W peak)
Sensitivity (SPL / 1 W @ 1 m)[5]	87 dB SPL
Maximum SPL @ 1 m[6]	112 dB SPL (118 dB SPL peak)
Nominal Impedance	8 Ω
Transformer Taps (70/100 V)	CVT-MA12EX transformer available
Transducers	
Driver Compliment	Twelve (12) 2.25" (57 mm) high-excursion, weather-resistant drivers
Physical	
Enclosure	Extruded-aluminum sidewalls with zinc-plated steel top and bottom endcaps, all powder coated
Grille	Powder-coated aluminum grille
Environmental	Outdoor per IEC 529 IPX5
Connectors	Two (2) parallel-wired NL4 Neutrik® Speakon® connectors Two (2) two-conductor barrier strips
Suspension / Mounting	Six (6) x M6 threaded inserts (back)
Dimensions	38.8" H x 4.1" W x 5.5" D (985 mm x 104 mm x 139 mm)
Net Weight	21 lb (9.4 kg)
Shipping Weight	23 lb (10.4 kg)
Product Code	
Black	317302-0100
White	317302-0200

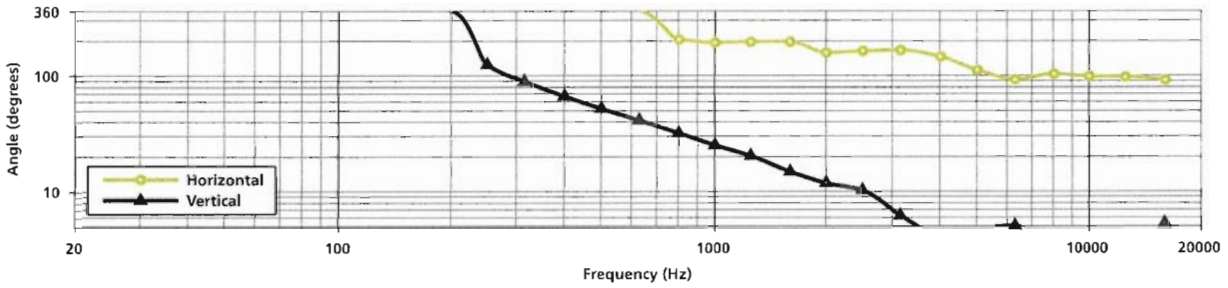
Footnotes:

1 Frequency response and range measured on-axis with recommended active EQ in an anechoic environment.
2 Vertical coverage varies by number of modules vertically arrayed and distance from line-source boundary. Use Modeler® software for the best prediction.
3 Power handling tested using pink noise filtered to meet IEC 268-5, 6 dB crest factor, 100 hours, with recommended EQ.
4 MA12EX PowerHandling. 150W for full-range music and speech applications. Speech-only applications (155 Hz to 12 kHz), power handling (continuous) at 300W/1200W.
5 Sensitivity measured in free field (no boundary-loading gain) with recommended active EQ, referenced to 1W/1m.
6 Maximum SPL calculated from sensitivity and power handling specifications, exclusive of power compression.

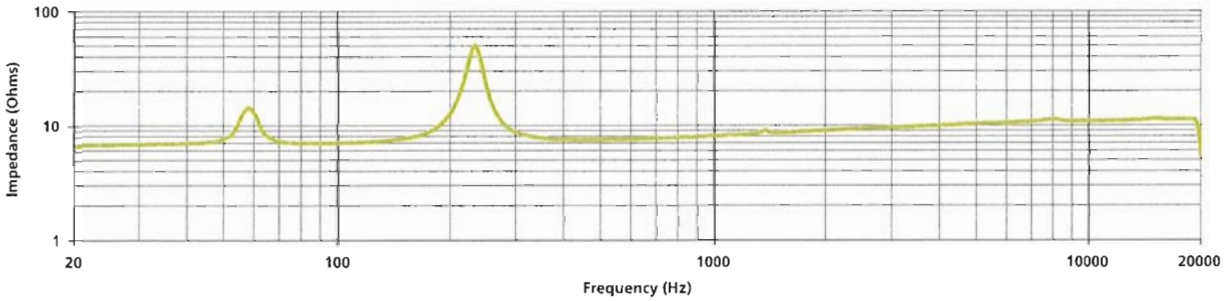
Directivity Index and Q



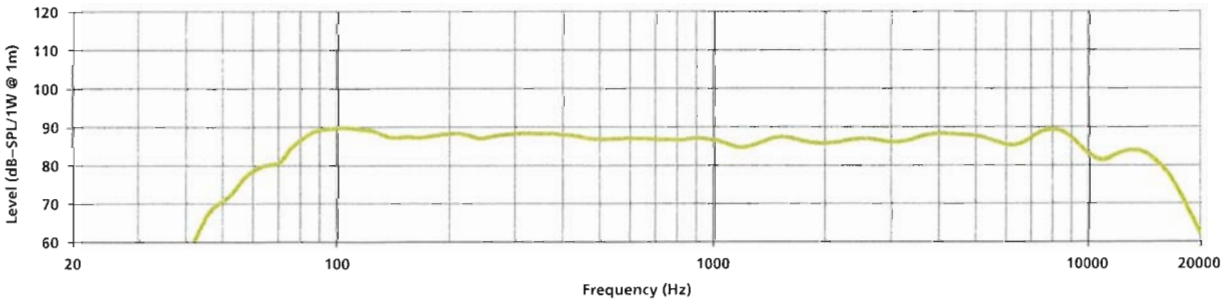
Beamwidth



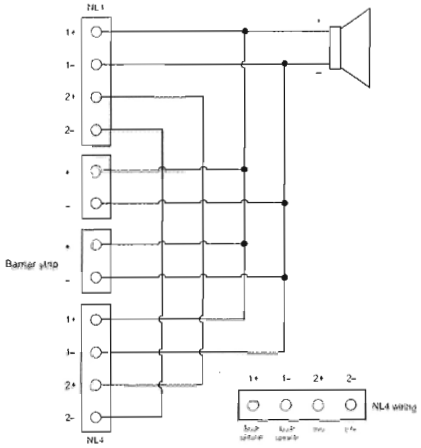
Impedance



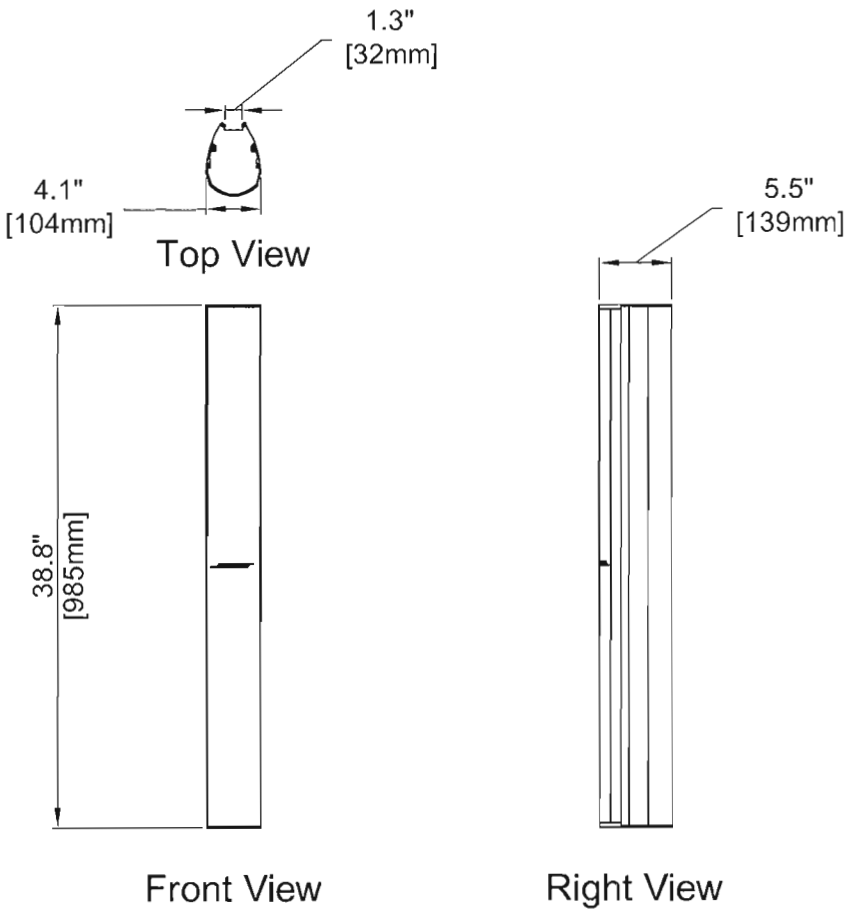
On-Axis Response



Wiring Diagram



Mechanical Diagrams

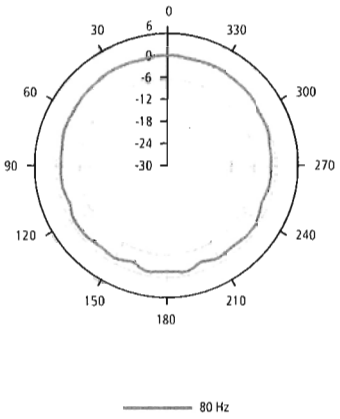


BOSE

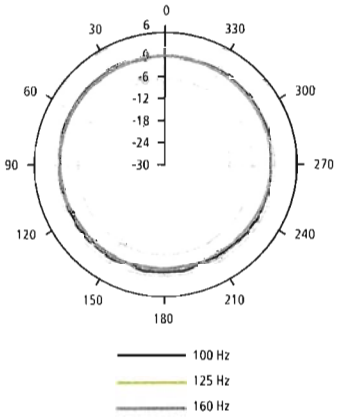
TECHNICAL DATA SHEET

Horizontal Plots

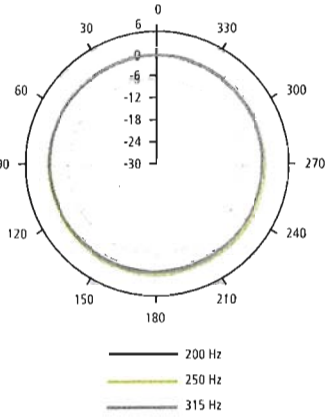
63 Hz Octave Band



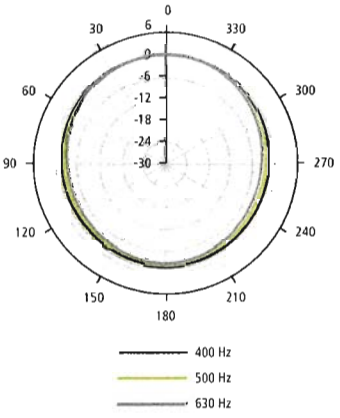
125 Hz Octave Band



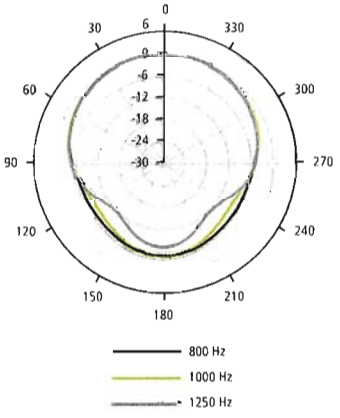
250 Hz Octave Band



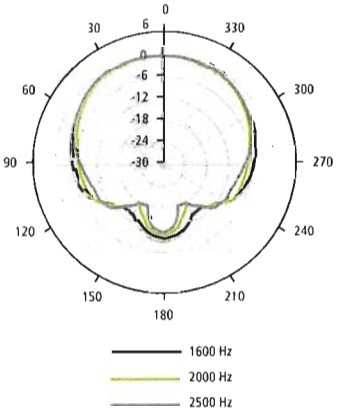
500 Hz Octave Band



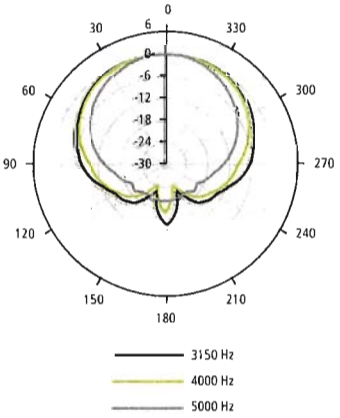
1000 Hz Octave Band



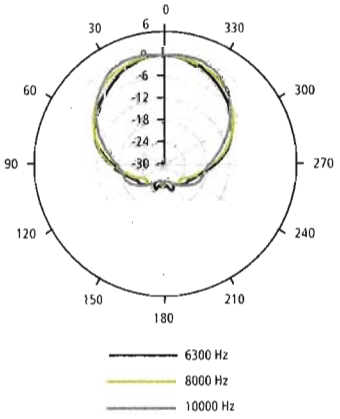
2000 Hz Octave Band



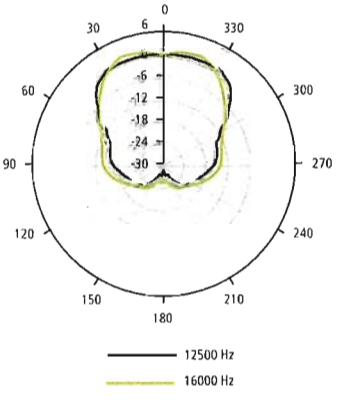
4000 Hz Octave Band



8000 Hz Octave Band

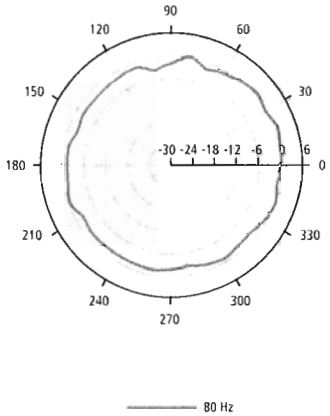


16000 Hz Octave Band

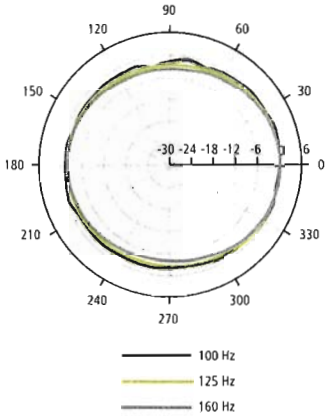


Vertical Plots

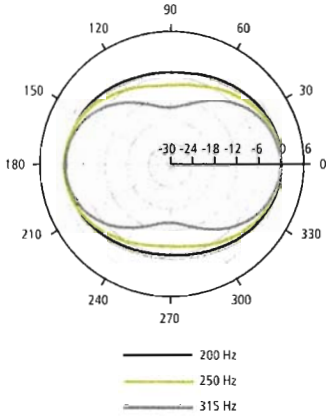
63 Hz Octave Band



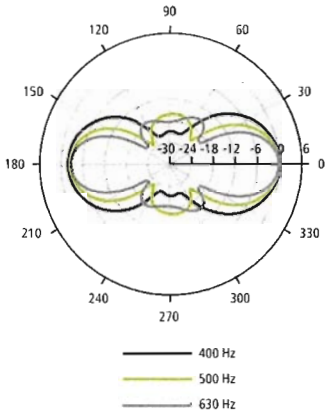
125 Hz Octave Band



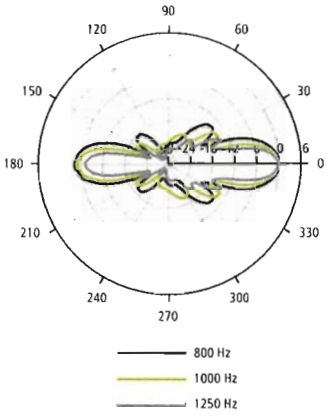
250 Hz Octave Band



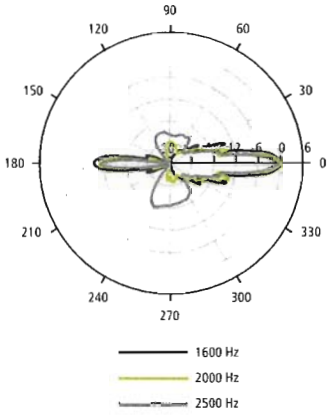
500 Hz Octave Band



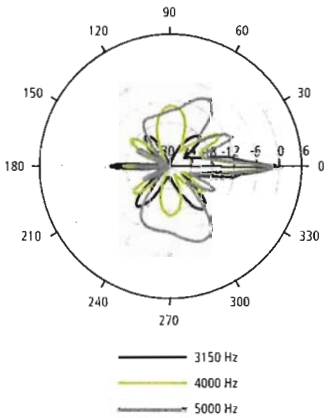
1000 Hz Octave Band



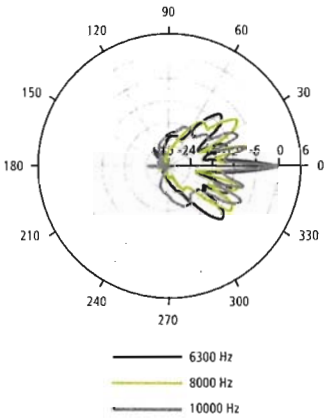
2000 Hz Octave Band



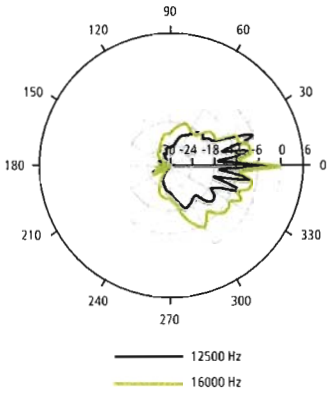
4000 Hz Octave Band



8000 Hz Octave Band



16000 Hz Octave Band



BOSE®

Architects' and Engineers' Specifications

The loudspeaker shall be a multiple driver, full-range system with matched active equalization as follows:

The transducer complement shall consist of twelve 2.25" (57 mm) high-excursion, weather-resistant drivers mounted in an Articulated Array® loudspeaker design. Each driver shall have a rated impedance of 5 ohms and wired in series/parallel, resulting in a composite nominal impedance of 8 ohms.

The nominal horizontal beamwidth of the loudspeaker shall be 160 degrees, and the vertical coverage is a band of constant height. The power handling capacity of the loudspeaker shall be 150 watts continuous pink noise, band-limited from 75 Hz to 13 kHz (±3 dB).

The loudspeaker shall be provided with a ducted vent system, tuned at 75 Hz. The input connector of the loudspeaker module shall consist of two parallel-wired NL4 Neutrik® Speakon® connectors and two (2) two-conductor barrier strips.

The enclosure of the MA12EX speaker module shall be extruded-aluminum sidewalls with zinc-plated steel top and bottom endcaps, all powder coated. Its outer dimensions shall be 38.8" x 4.1" x 5.5" (985 mm x 104 mm x 139 mm). Its weight shall be 21 lb (9.4 kg).

The loudspeaker shall be the Bose® Panaray® MA12EX modular line array loudspeaker.

All information subject to change without notice.
® 2013 Bose Corporation
All trademarks are those of their respective owners.

FreeSpace® 360P Series II loudspeaker

BOSE

TECHNICAL DATA SHEET

Key Features

- **Full-range** environmental loudspeaker with one downward firing 4.5" (114 mm) advance composite environmental full-range driver for in-ground or above-ground mounting
- **Domed port grille** reflects sound into the listening area for clear, consistent performance
- **Cabinet shape** acts as acoustic diffuser directing mid- and high-frequency energy out towards listeners. Base of loudspeaker acts as a tuned, multi-chambered ported enclosure
- **Multi-tap line transformer** provides easy-to-change tap settings
- **Tamper**-resistant design
- **Internal speaker** protection circuit safeguards drivers

Product Overview

The Bose® FreeSpace 360P Series II is a full-range environmental loudspeaker designed to blend with landscaping for in-ground or above-ground applications, such as shopping malls, outdoor restaurants, resorts and theme parks. It features 360° of horizontal coverage and frequency range down to 60 Hz.

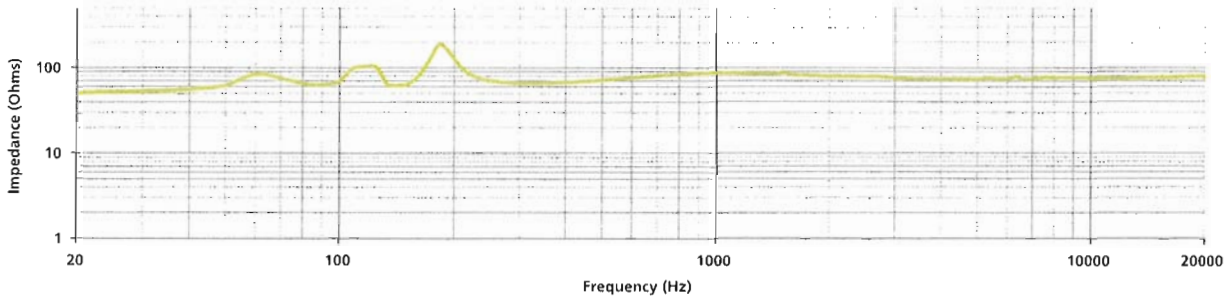
Technical Specifications

System Performance	
Frequency Response (+/-3 dB)[1]	70 Hz - 10 kHz
Frequency Range (-10 dB)[1]	60 Hz - 15 kHz
Nominal Dispersion	360° H x 50° V
Recommended High-Pass Filter	60 Hz high-pass filter
Loudspeaker EQ	Recommended
Overload Protection	PTC
Long-Term Power Handling[2]	80 W (320 W peak)
Sensitivity (SPL / 1 W @ 1 m)[3]	87 dB SPL
Maximum SPL @ 1 m[4]	100 dB SPL (106 dB SPL peak)
Nominal Impedance	4 Ω (transformer bypassed)
Transformer Taps (70/100 V)	10 W, 20 W, 40 W, 80 W
Transducers	
Driver Compliment	4.5" (114 mm) Bose® environmental driver
Physical	
Enclosure	Glass-reinforced polypropylene, textured
Environmental	Outdoor per IEC 529 IP35
Connectors	External multi-wire cable with wire nuts included
Suspension / Mounting	Three (3) #10 (M4) holes in base. Three #10 M4 screws required
Dimensions	Diameter: 14.5" (368 mm) Height: 14.9" (379 mm)
Net Weight	14.5 lb (6.6 kg)
Shipping Weight	14.9 lb (6.8 kg)
Product Code	
Green	040151

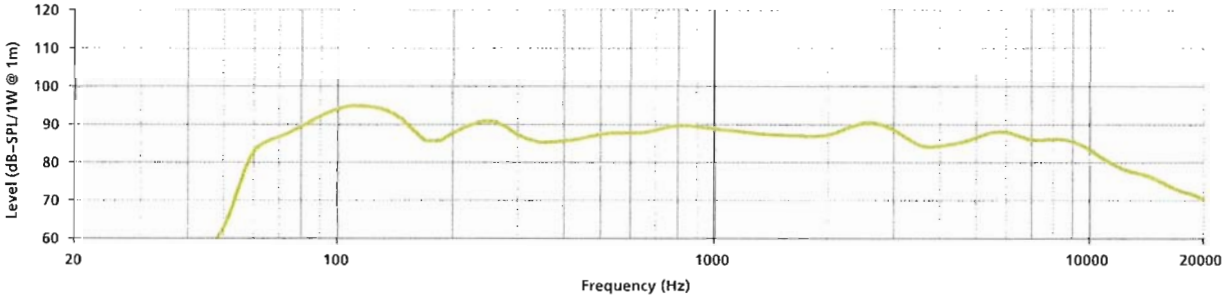
Footnotes:

1 Frequency response measured 30° above the ground plane (per recommended installation) in an anechoic environment.
2 Power handling tested using pink noise filtered to meet IEC 268-5. 6 dB crest factor, 100 hours, with recommended EQ.
3 Sensitivity. 70Hz-15kHz pink noise is applied to the speaker and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level is measured at 1 meter, 30° above the ground plane.
4 Max SPL. Calculated level for sine wave is obtained by adding 10*log(W tap) to the measured sensitivity of the speaker.

Impedance



On-Axis Response

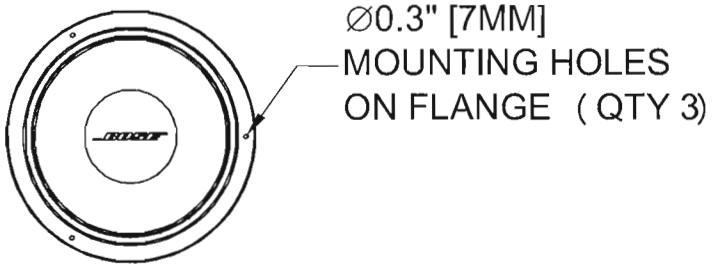


Tap Chart

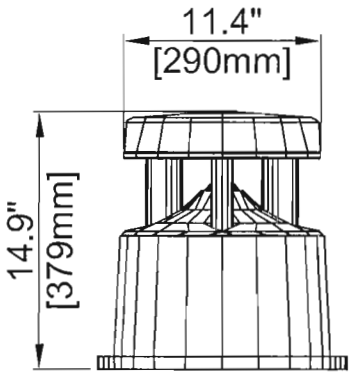
FreeSpace 360-II Tap Chart

Listener Distance	m	3	4.5	6	
	ft	10	15	20	
TAP	10	87	84	81	dB_{SPL}
	20	90	87	84	
	40	93	90	87	
	80	96	93	90	

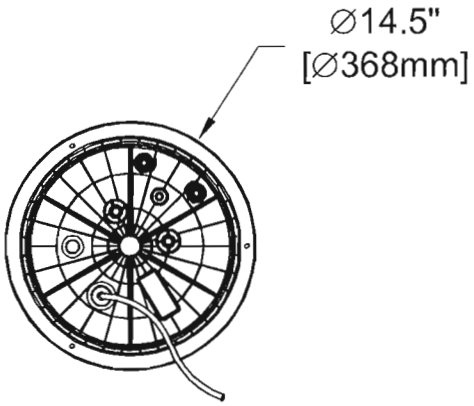
Mechanical Diagrams



Top View



Side View



Bottom View

Architects' and Engineers' Specifications

The loudspeaker shall be a ported loudspeaker system utilizing one 4.5" (114 mm) HVC environmental full-range driver mounted in the underside of the top of the loudspeaker enclosure. The driver shall have a rated impedance of 4 Ω and shall be wired in parallel with a line voltage-matching (stepdown) transformer with taps at 10, 20, 40, or 80 watts.

The loudspeaker shall have a single-port vented system, with a maximum continuous acoustic output of 100 dB SPL from 70 Hz to 10 kHz, with measurements referenced with full-bandwidth pink noise at 1 meter at the loudspeaker's rated power.

The input connection shall consist of wires with wire nuts on a cable attached to the base of the loudspeaker. The nominal dispersion of the loudspeaker shall be 360° horizontal and 50° vertical.

The loudspeaker shall be the Bose® FreeSpace® 360P Series II loudspeaker.

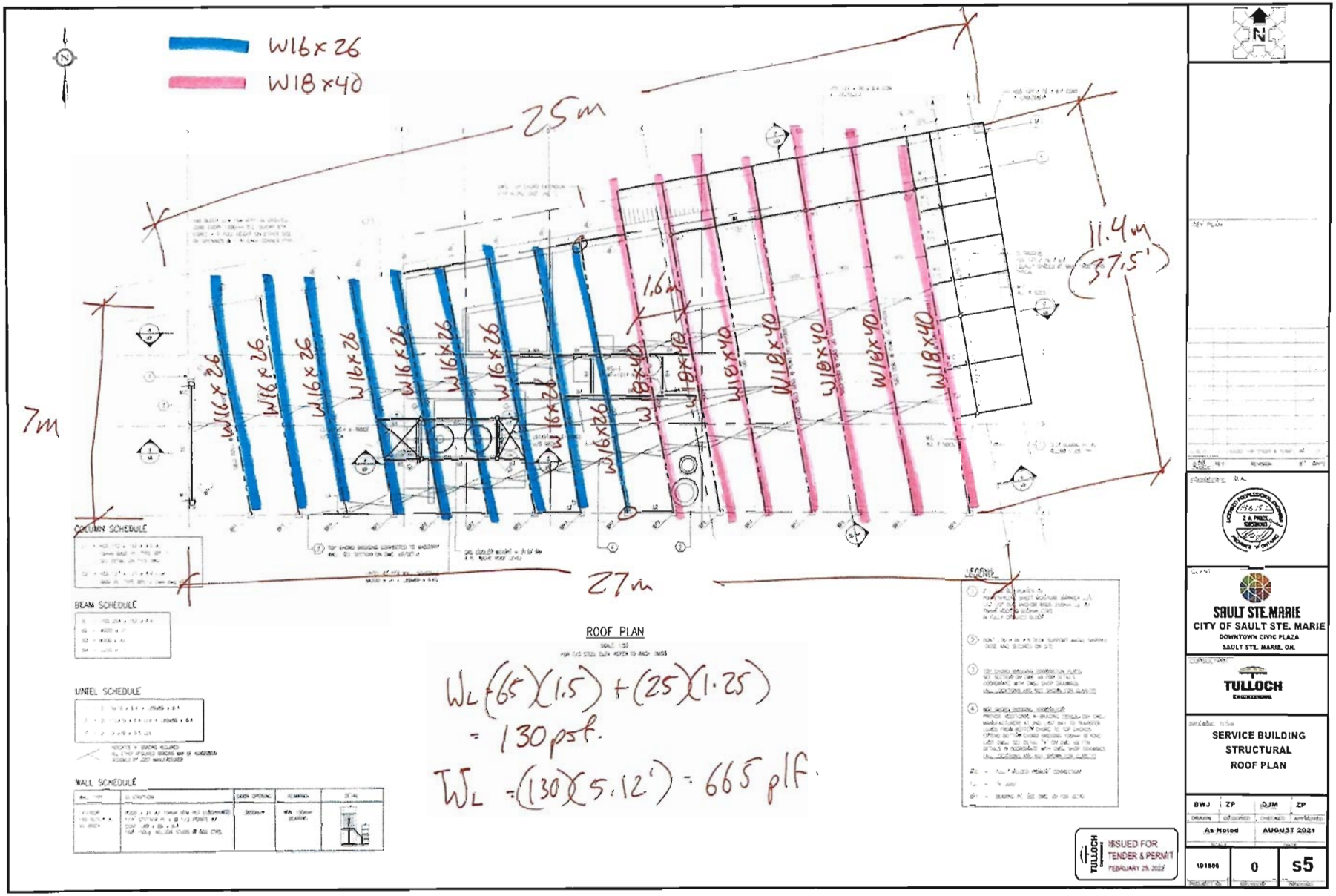
Safety and Regulatory Compliance

The FreeSpace® 360P Series II loudspeaker is suitable for general purpose use. It complies with EMC Directive 89/336/EEC and Article 10 (1) of the Directive in compliance with EN50081-1, EN50082-1, as signified by the CE mark.

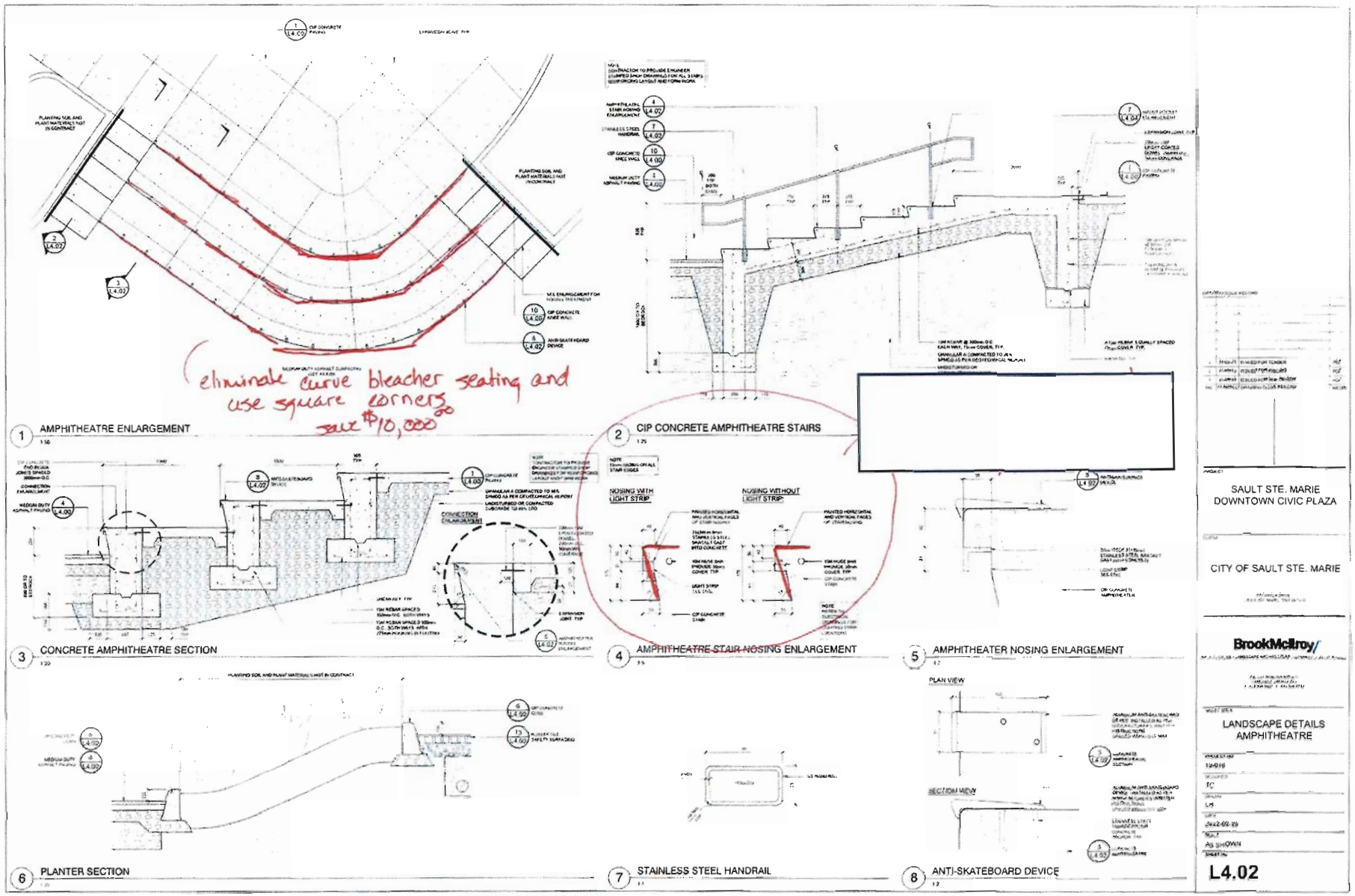
TECHNICAL DATA SHEET

All information subject to change without notice.
® 2012 Bose Corporation
All trademarks are those of their respective owners.

Proposed Beam Alternative


W16x26
W18x40
25m
11.4m
(37.5')
7m
27m
1.6m
W16x26
W18x40
COLUMN SCHEDULE
BEAM SCHEDULE
LINTEL SCHEDULE
WALL SCHEDULE
ROOF PLAN
WL (65)(1.5) + (25)(1.25)
= 130 psf.
TWL = (130)(5.12') = 665 plf.
LEGEND
ISSUED FOR TENDER & PERMIT
FEBRUARY 25, 2022
SAULT STE.MARIE
CITY OF SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
SAULT STE. MARIE, ON.
TULLOCH
SERVICE BUILDING
STRUCTURAL
ROOF PLAN
BWJ
ZP
DJM
ZP
As Noted
AUGUST 2021
191806
0
S5

Proposed CIP Savings


eliminate curve bleacher seating and use square corners
save $10,000
1 AMPHITHEATRE ENLARGEMENT
2 CIP CONCRETE AMPHITHEATRE STAIRS
3 CONCRETE AMPHITHEATRE SECTION
4 AMPHITHEATRE STAIR NOSING ENLARGEMENT
NOSING WITH LIGHT STRIP
NOSING WITHOUT LIGHT STRIP
5 AMPHITHEATER NOSING ENLARGEMENT
6 PLANTER SECTION
7 STAINLESS STEEL HANDRAIL
8 ANTI-SKATEBOARD DEVICE
PLAN VIEW
SECTION VIEW
SAULT STE. MARIE
DOWNTOWN CIVIC PLAZA
CITY OF SAULT STE. MARIE
BrookMcIlroy
LANDSCAPE DETAILS
AMPHITHEATRE
AS SHOWN
L4.02

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-109

APPOINTMENTS: A by-law to appoint Mike Oliverio as Deputy Chief Fire Operations, Training and Logistics.

WHEREAS the *Fire Protection and Prevention Act*, 1997, S.O. 1997, c.4, as amended, permits a municipality to establish, maintain and operate a fire department;

NOW THEREFORE THE COUNCIL of The Corporation of the City of Sault Ste. Marie **ENACTS** as follows:

1. **APPOINTMENT – DEPUTY CHIEF FIRE OPERATIONS, TRAINING AND LOGISTICS**

   Mike Oliverio is hereby appointed as Deputy Chief Fire Operations, Training and Logistics commencing April 29, 2022.

2. **BY-LAWS 2018-127 REPEALED**

   By-law 2018-127 is hereby repealed.

3. **EFFECTIVE DATE**

   This by-law is effective on April 29, 2022.

PASSED in open Council this 13th day of June, 2022.

MAYOR – CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

lv \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-109 Appointment Mike Oliverio as Deputy Fire Chief.docx

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-110

APPOINTMENTS: A by-law to appoint Paul Antonello, Dave Kochanowski, Naomi Thibault and Craig Genys as Fire Prevention Officers for the purpose of enforcing By-law 81-404 and By-law 2009-82.

WHEREAS the *Fire Protection and Prevention Act*, Part 2 (1)(a) provides that every municipality shall establish a program in the municipality which must include public education with respect to the fire safety and certain components of fire prevention;

WHEREAS the *Fire Protection and Prevention Act*, Part 2 (1)(b) provides that every municipality shall provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances;

WHEREAS the *Fire Protection and Prevention Act*, Part 2 (2) provides that in discharging its responsibilities under subsection (1), a municipality shall under subsection (1)(a) appoint a community fire safety officer or a community fire safety team;

AND WHEREAS the Council of the Corporation of the City of Sault Ste. Marie deems it desirable and expedient to appoint Fire Prevention Officers.

NOW THEREFORE THE COUNCIL of The Corporation of the City of Sault Ste. Marie **ENACTS** as follows:

APPOINTMENT – FIRE PREVENTION OFFICERS

The following Fire Prevention Officers are hereby appointed for the purpose of enforcing By-law 81-404 and By-law 2009-82:

Paul Antonello appointed January 6, 2003;
Dave Kochanowski appointed March 8, 2021;
Naomi Thibault appointed October 18, 2021; and
Craig Genys appointed May 16, 2022.

1. **BY-LAW 2018-128 REPEALED**

By-laws 2018-128 is hereby repealed.

PASSED in open Council this 13th day of June, 2022.

MAYOR – CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-111

TEMPORARY STREET CLOSING: A by-law to amend By-law 2022-31 being a by-law to permit the temporary closing of Brock Street between Albert Street East and the northerly laneway adjacent to Civic #181 from February 23, 2022 to June 1, 2022.

THE COUNCIL of the Corporation of the City of Sault Ste. Marie pursuant to section 10 of the *Municipal Act, 2001*, S.O. 2001, c. 25 and amendments thereto **ENACTS** as follows:

1. **SECTION 1 TO BY-LAW 2022-31 IS AMENDED**

   Section 1 to By-law 2022-31 is amended by extending the street closure to August 31, 2022.

2. **EFFECTIVE DATE**

   This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

_____

MAYOR - CHRISTIAN PROVENZANO

_____

DEPUTY CITY CLERK – MADISON ZUPPA

Lv \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-111 Amendment Temporary Street Closing.docx

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-112

AGREEMENT: A by-law to authorize the execution of the Agreement between the City and Netagen Communication Technologies Inc. for the use of Netagen's NETAGEN COMMANDER 911 services.

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, **ENACTS** as follows:

1. **EXECUTION OF DOCUMENT**

The Mayor and City Clerk are hereby authorized for and in the name of the Corporation to execute and affix the seal of the Corporation to the Agreement dated May 31, 2022 between the City and Netagen Communication Technologies Inc., a copy of which is attached as Schedule "A" hereto. This Agreement is for the use of Netagen's NETAGEN COMMANDER 911 services.

2. **SCHEDULE "A"**

Schedule "A" forms part of this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

lv \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-112 Netagen Commander 911 Service.docx

netagen

Master Services Agreement

2022

MASTER SERVICES AGREEMENT

THIS AGREEMENT made as of __May 31_____ , 2022 ("Effective Date"),

BY AND BETWEEN:

NETAGEN COMMUNICATION TECHNOLOGIES INC. of 236 Westbrook Rd, Ottawa, Ontario, K0A 1L0, incorporated under the laws of the Province of Ontario

("Netagen")

- and -

THE CORPORATION OF THE CITY OF THE CITY OF SAULT STE. MARIE at 99 Foster Dr, Sault Ste. Marie, ON P6A 5X6

(the "Customer")

WHEREAS Netagen is a leader in the design, implementation and maintenance of state-of-the-art high-performing networks utilizing software-defined networking, cloud-based infrastructure, expanded security, greater flexibility and new consumption models;

AND WHEREAS Netagen by right of license can resell its managed networking services (the "Networking License") to customers in the Dominion of Canada;

AND WHEREAS the Customer wishes to retain the services of Netagen pursuant to the terms and conditions contained in this agreement (hereinafter called the "MSA");

NOW THEREFORE THIS AGREEMENT WITNESSES THAT in consideration of the premises and mutual covenants and agreement herein contained, Netagen and the Customer (individually "Party" and collectively the "Parties") agree as follows:

I. PROVISION OF SERVICES

1.1 **Services.** Netagen agrees to provide the Customer the services (each, the "Service" and all, the "Services") in accordance with the specific terms and conditions for each Service purchased by the Customer, as set forth on the Service Schedule(s) referencing this MSA and attached hereto as Schedule A to this MSA. The Parties to this Agreement acknowledge and agree that Netagen is not selling any proprietary rights to the Services to the Customer but rather Netagen is granting the Customer only a "right to use" license to use the Services.

1.2 **Service Schedules.** Each Service Schedule shall identify the Services to be provided by Netagen to the Customer, the recurring charges, and any non-recurring charges for such Services. Applicable Service Schedules under this MSA may be entered into and performed by Netagen and/or any of its affiliates.

1.3 **Suspension of Services.** Netagen reserves the right to suspend or terminate the delivery of all or any part of the Services required to be provided hereunder upon delivery of twenty-four (24) hours advance notice, if the Customer engages in activities that, in Netagen's sole discretion, may cause disruption or damage to its network or facilities, or immediately upon written notice if Netagen detects any fraudulent use of the Services or any criminal activity carried on by the Customer. In any case, Netagen shall provide written confirmation of such suspension and/or termination within forty-eight (48) hours thereafter. The parties to this MSA acknowledge and agree that notwithstanding the delivery of such suspension and/or termination notices by Netagen to the Customer pursuant to the terms of this MSA the Customer shall remain fully liable and responsible for any and all payments owing by the Customer to Netagen for any Services which have been provided by Netagen prior to the date of the suspension of such Services.

1.4 **Compliance with Laws and Obligations.** Each Party shall ensure that it: (i) obtains and maintains all valid licenses, approvals, consents, and authorizations necessary for it to perform lawfully its obligations under this MSA; and (ii) complies at all times with all relevant laws and obligations, including without limitation any applicable license under the Party's local telecommunication regulations. Neither Party shall have any liability under this MSA for failure of the other Party to comply with any such relevant laws or obligations or to obtain and maintain the necessary licenses, consents, authorizations, or approvals.

1.5 **Prohibition on Resale and Restrictions.** Customer shall not to resell or transfer the Service to any other person for any purpose, without express written permission from Netagen in advance. Unless otherwise agreed to in writing by Netagen, Customer shall not use the Service for auto-dialing, continuous or extensive call forwarding, inbound or outbound call centers, telemarketing (including without limitation charitable or political solicitation or polling), fax broadcasting or fax blasting.

1.6 **Lawful Use of Service and Equipment.**

1.6.1 **Prohibited Uses.** The Customer agrees to use the Service only for lawful purposes. Without limitation, the Customer agrees not to use the Service for transmitting or receiving any communication or material of any kind which, in Netagen' sole judgment, the transmission, receipt or possession of such communication or material: (i) would constitute a criminal offense, give rise to a civil liability, or otherwise violate any applicable local, state, national or international law, or (ii) encourages conduct that would constitute a criminal offense, give rise to a civil liability, or otherwise violate any applicable local, state, national or international law (the uses described in clauses (i) and (ii) above are collectively referred to as "Prohibited Uses"). Netagen reserves the

right to terminate the Service immediately and without advance notice if Netagen, in its sole discretion, believes that the Customer is using the Service for a Prohibited Use. Upon any such termination, the Customer shall continue to be responsible for the full charges to the end of the current term, including without limitation unbilled charges, all of which immediately become due and payable and may at Netagen' discretion be immediately charged to the Customer's bank account. If Netagen, in its sole discretion, is of the opinion that the Customer has used the Service for a Prohibited Use, Netagen may forward the objectionable material, as well as the communications with Netagen and any personally identifiable information to the appropriate authorities for investigation and prosecution and the Customer hereby consents to such release of information.

1.6.2 **Regulatory Obligation.** Without limiting the generality of the above, the Customer is required to comply with the regulatory obligations described in CRTC policy as amended, extended or replaced, from time to time by the CRTC. Netagen is responsible to notify the client within 5 business days of receiving notice of any non-conformance issues.

1.7 **Theft of Service.** The Customer agrees to notify Netagen immediately, in writing or by calling the Netagen customer support line, if the Customer becomes aware, at any time, that the Customer's Service is being stolen or fraudulently used. When the Customer calls or writes, the Customer must provide the Customer's account number and a detailed description of the circumstances of the Equipment theft or fraudulent use of Service. Failure to do so in a timely manner may result in the termination of the Customer's Service and additional charges to the Customer. Until such time as Netagen receives proper notice of the theft or fraudulent use, the Customer will be liable for all use of the Service.

II. START OF SERVICE; PAYMENT TERMS

2.1 **Start of Service and Billing.** Netagen will inform the Customer in writing and electronically, including, without limitation, email communication, that the Customer's ordered Service(s) are available for use by the Customer ("**Service Commencement Notice**"). Upon receipt of the Service Commencement Notice, the Customer shall have a period of seventy-two (72) hours to confirm that the Service(s) is properly functioning. In the event that the Customer does not deliver written notice to Netagen within such seventy-two (72) hour period that the Service(s) is not properly functioning, the Customer's acceptance of such Services shall be assumed and billing shall commence effective as of the date of the Service Commencement Notice, regardless of whether the Customer is prepared to accept delivery of the ordered Service(s). In the event that the Customer notifies Netagen within the time period stated above that the Service is not functioning properly, then Netagen shall correct any deficiencies in the Service(s) and deliver a new Service Commencement Notice to the Customer, after which the process stated above will be repeated.

2.2 **Recurring and Non-Recurring Charges.** Unless otherwise specified in the applicable Service Schedule, any non-recurring charges will be invoiced by Netagen following the execution of the applicable Service Schedule. Recurring charges will be billed monthly in advance, except for charges that are dependent upon usage of Services, which are billed in arrears. Billing for partial months will be prorated based on a calendar month.

2.3 **Invoicing.** Unless otherwise specified in each such applicable Service Schedule, all amounts payable under the MSA shall be payable, in full, within thirty (30) days of the date of invoice ("Due Date"), in Canadian

dollars. Monthly recurring invoices are invoiced one month in advance. These payment terms are applicable to customers of Netagen who meets this deadline on a consistent and timely basis. These payment terms are therefor subject to ongoing credit review and approval by Netagen and can be amended as provided in Section 2.6 below, in the event that the Customer has an Insolvency Event (as defined below), becomes delinquent in making the payments on or before the Due Date, defaults in payments to be made to any third parties, or has liens registered against it by any governing agency. Should Netagen determine that the Customer is to be classified as a poor credit risk, the Customer credit rating is to be downgraded accordingly and pursuant to Section 2.6 stricter payment terms will be applied by Netagen for the delivery of the Services to the Customer.

2.4 **Disputed Charges.** All undisputed amounts must be paid in full by the Due Date. In the event the Customer disputes any amount stated on an invoice, the Customer shall notify Netagen in writing of such dispute within twenty (20) days of receipt of the applicable invoice and shall provide Netagen with such documentation as may be reasonably required to resolve the dispute.

2.5 **Late Fees.** Any undisputed payments not received by the Due Date will bear interest at a rate of two percent (2.0%) per month, or the maximum rate permitted by applicable law, whichever is less, from the Due Date until paid in full. In addition, in the case of late payment, Netagen reserves the right to, without limitation, suspend the performance of the Service(s), restrict the Customer's access to the Customer space and equipment, refuse to provide any existing Service(s) and/or new Service(s) requested by the Customer and/or exercise any termination rights it has under this MSA.

2.6 **Change in Payment Terms.** Netagen reserves the right to change the Customer's payment terms, including requiring a deposit or another form of security, at any time when the Customer's payment history under any Service Schedule does not conform to this Section or the Customer has an Insolvency Event (as defined below). The acceptance and deposit by Netagen of any payment from the Customer that contains reference of any type that such payment constitutes "payment in full" shall not constitute an accord and satisfaction or a waiver by Netagen of any right(s) it possesses, in law or equity, to collect payment in full from the Customer for any and all Services provided to the Customer under this MSA.

2.7 **Taxes.** All Services under this MSA are provided exclusive of any applicable federal, provincial, local, or foreign taxes, duties, or charges imposed by any governmental authority. In the event that Netagen is required to pay any such taxes, charges, or duties attributable to the Customer, Netagen will inform the Customer with at least seven (7) days notice and the Customer shall reimburse Netagen for such amounts attributable to the Customer within thirty (30) days of such notice.

2.8 **Changes in Pricing.** In the event of any change in Network Licensing, applicable law, regulation, decision, rule or order that materially increases the costs or other terms of delivery of the Service(s), Netagen and the Customer will negotiate, in good faith, regarding how to address the change and, in the event that the parties are unable to reach agreement within thirty (30) days after Netagen's delivery of written notice requesting negotiation, then (i) Netagen may modify this MSA upon written notice, to the extent necessary to address such change, or terminate this MSA, and (ii) if Netagen elects to modify this MSA, the Customer may terminate the affected Service(s) by delivering written notice of termination to Netagen no later than sixty (60) days after its' receipt of Netagen's notice.

In addition to the foregoing, Netagen may increase any charges payable by the Customer to Netagen during any Renewal Term by providing written notice of the new applicable charges at any time prior to the end of the then-current term;

III. TERM AND TERMINATION

3.1 **Term.** This MSA will commence as of the date of the final Service Commencement Notice issued in accordance with clause 2.1 and will continue for a period of **60 months** (**5**) year(s) (the "Initial Term").

3.2 **Termination.** This MSA may be terminated prior to the expiration of its Initial Term or any Renewal Term(s) upon the occurrence of any of the following events:

3.2.1 By either Party upon a failure to comply with the terms of this MSA by the other Party and the breaching Party fails to cure the breach within ten (10) calendar days after written notice of the breach from the non-breaching Party.

3.2.2 Immediately by either Party if the other Party takes or suffers any action as a result of its indebtedness, such as an action in bankruptcy, an assignment for the benefit of creditors, the appointment of a receiver or trustee or the liquidation of all or substantially all of its assets (each an "Insolvency Event").

3.3 **Consequences of Expiration or Termination.** Upon the termination of this MSA for any reason contained herein, Netagen will be entitled to immediately cease providing Services to the Customer. All amounts due to Netagen will become immediately due and payable upon such termination, and the provisions of Section 2 regarding late fees will continue to apply. Notwithstanding the expiration or termination of this MSA for any reason, the provisions that, by their nature survive termination, will continue to apply. Upon expiration and or termination of this MSA any license rights granted by Netagen to the Customer shall automatically terminate and become null and void and any further use of such license rights by the Customer shall be deemed default under the terms of this MSA and Netagen shall have all rights of recourse available to it under the laws of the jurisdiction under which this MSA was made.

The Customer may terminate the Service in its entirety during the contract term upon sixty (60) days written notice subject to the following termination fees:

- 100% of the unpaid balance for the first contract year (includes any one-time charges plus recurring monthly charges), plus
- 50% of the remaining unpaid balance for years 2 to 5 of the contract

3.4 **Obligations of the Customer Upon Termination.** Within five (5) business days of expiration, or the earlier termination, of the MSA or any Service Schedule, the Customer shall remove all of its equipment and other personal property (which shall include any hardware or software licensed by the Customer from a third party) from Netagen 's facility(ies). If the Customer fails to remove its' equipment or other personal property, Netagen may, without prior notice to the Customer, disconnect, remove and dispose of the Customer's equipment or other personal property at the Customer's expense.

IV. REPRESENTATION AND WARRANTIES

4.1 **Representations and Warranties of Netagen.** Netagen represents and warrants to the Customer that Netagen: (i) has the authority to enter into this MSA and this MSA constitutes a valid and binding obligation of Netagen that does not violate any other agreement between Netagen and any other person, (ii) will provide the Services in compliance with all applicable laws, rules and regulations; and (iii) will perform the Services in a workmanlike manner.

4.2 **Representations and Warranties of the Customer.** The Customer represents and warrants to Netagen that the Customer: (i) has the authority to enter into this MSA and this MSA constitutes a valid and binding obligation of the Customer that does not violate any other agreement between the Customer and any other person, (ii) will use the Service(s) in compliance with all applicable laws, rules and regulations; (iii) will use the Service(s) only for its intended use as described in Schedule A and (iv) will comply with Netagen 's Policies and Procedures.

The Customer further covenants that the Customer (i) will not resell or sublicense the Services (ii) the Customer will remain liable for the payment of all charges due under this Agreement and all acts or omissions of any sublicense of the Customer shall be attributable to the Customer.

V. LIABILITY AND INDEMNITY

5.1 **Limitation of Liability.** Except in the case of a breach of a confidentiality obligation, notwithstanding anything to the contrary in this MSA, in no event shall either Party be liable to the other or any third party in any respect for any indirect, incidental, consequential, exemplary, punitive, reliance or special damages, or for any loss of revenue, loss of data, interruption of business, profits, use, data, goodwill or business opportunities of any kind or nature whatsoever, arising in any manner from this MSA and the performance or non-performance of any obligations hereunder, even if the relevant party has been advised of the possibility of such damages.

EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, NO WARRANTIES, EXPRESS OR IMPLIED, ARE MADE BY NETAGEN, AND NETAGEN EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OR WARRANTIES ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICE. NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, IN NO EVENT WILL NETAGEN'S LIABILITY UNDER ANY CLAIM MADE PURSUANT TO THIS AGREEMENT EXCEED AN AMOUNT EQUAL TO THE TOTAL AMOUNT RECEIVED BY NETAGEN PURSUANT TO THE SERVICES ORDER UNDER WHICH THE CLAIM AROSE, IN THE TWELVE-MONTH PERIOD IMMEDIATELY PRECEEDING THE TIME THAT SUCH CLAIM AROSE.

5.2 **Customer Content.** The Customer is liable for any and all liability that may arise out of the content transmitted by or to the Customer or users of the Services. The Customer and/or the users of the Services and any content associated with such use will, at all times, comply with all applicable laws, regulations, and written and electronic instructions for use. Netagen reserves the right to terminate or suspend affected Services, and/or remove the Customer's or users' content from the Services, if Netagen determines that such use or content does not conform with the requirements set forth in this Agreement or interferes with Netagen' ability to provide Services to the Customer or other customers or receives notice from anyone that the Customer's and/or users' use or Content may violate any laws or regulations. Netagen' actions or inaction under this Section shall not

constitute review or approval of the Customer's or users' use or content. The Customer hereby indemnifies and holds Netagen harmless from and against any and all liability arising from the content transmitted by or to the Customer or to users using the Services. A "user" means any person, whether authorized or unauthorized, using the Service provided to the Customer.

5.3 **No Third-Party Beneficiaries.** This Agreement shall not provide any person or entity who is not a party specifically named under this Agreement with any remedy, claim, liability, reimbursement, or cause of action against Netagen or create any other third-party beneficiary rights.

5.4 **Indemnification.** Each party hereby indemnifies the other party, its Affiliates, and their respective officers, directors, members, shareholders, employees, agents, assigns and successors, and shall hold them harmless against any losses, liabilities, damages, costs or expenses (including reasonable attorneys' fees) resulting from a third party claim, arising out of or alleged to have arisen out of, (a) such party's breach of its obligations, representations or warranties under this MSA or (b) bodily injury, death or property damage caused by such party. The indemnified party agrees to give prompt written notice to the indemnifying party of any such claim; provided, that any delay in furnishing such notice shall not discharge the indemnifying party from its indemnification obligation hereunder, except to the extent such delay results in actual prejudice to the indemnifying party. The indemnifying party shall undertake and conduct the defense of any claim so brought. The indemnifying party shall keep the indemnified party advised of the progress of any such claim and the indemnified party shall have the right to participate in such claim at its own expense. If the indemnifying party shall fail to take timely action to defend any such claim then the indemnified party may defend such claim at the indemnifying party's expense. The indemnifying party shall not have the right to settle, compromise or otherwise enter into any agreement regarding the disposition of any claim without the indemnified party's prior written consent, which may not be unreasonably withheld, except for a claim solely for monetary damages.

VI. CONFIDENTIALITY

6.1 **Confidentiality.** The Parties hereto hereby acknowledge that during the course of this MSA, either Party may acquire information regarding the other or its affiliates, its business activities and operations or those of its customers and suppliers, and its trade secrets including without limitation its customer lists, prospective customers, rates, network configuration, traffic volume, financial information, computer software, service, processes, methods, knowledge, research, development or other information of a confidential and proprietary nature (hereinafter "Confidential Information"). Each Party shall hold the Confidential Information in strict confidence and shall not reveal the Confidential Information, or any portion thereof. The foregoing obligations regarding disclosure of Confidential Information shall not apply, however, to any part of the Confidential Information which: (a) was already in the public domain or which becomes so through no fault of the receiving Party; (b) was already known or independently developed by the receiving Party; (c) was lawfully disclosed to the receiving Party prior to receipt hereof; (d) is expressly approved for release by written authorization of the disclosing Party; or (e) is disclosed pursuant to any judicial or governmental request, requirement or order provided, however, the receiving Party only makes disclosure to the extent required and, prior to making such disclosure, takes all reasonable steps to provide prompt and sufficient notice to the disclosing Party so that the disclosing Party may contest such request, requirement or order. This paragraph shall survive expiration or termination of this MSA for a period of three (3) year. Either Party may disclose Confidential Information of the other Party only to those of its own affiliates, agents or employees who require the Confidential Information for the purposes of this MSA only. Prior to disclosing the Confidential Information of the other Party to its own affiliates, agents or employees, each Party shall issue appropriate instructions to satisfy its obligations under

this section 5.1. Each Party, however, will remain fully liable for any breach of its obligations caused by the actions or omissions of any of its affiliates, agents or employees.

6.2 **Return of Information.** Upon request, the recipient of the Confidential Information will promptly return all Confidential Information (or any designated portion thereof), including all copies thereof, to the disclosing Party or, if so directed by the disclosing Party, destroy such Confidential Information. The recipient will also, within ten (10) days of written request by the disclosing Party, certify in writing that it has satisfied its obligations under this section.

6.3 **Injunctive Relief**. The Parties agree that an impending or existing violation of these confidentiality provisions would cause the disclosing Party irreparable injury for which it would have no adequate remedy at law, and agree that the disclosing Party may be entitled to obtain immediate injunctive relief prohibiting such violation, in addition to any other rights and remedies available to it.

VII. MISCELLANEOUS

7.1 **Independent Contractors.** It is expressly understood that the Parties hereto are acting hereunder as independent contractors and under no circumstances shall any of the employees of one Party be deemed to be employees of the other for any purpose. This MSA shall not be construed as authority for either Party to act on behalf of the other in any agency or other capacity or to make commitments of any kind for the account of or on behalf of the other Party except to the extent and for the purposes expressly provided for and set forth herein.

7.2 **Waiver.** The failure of either Party to give notice of default or to enforce compliance with any of the terms or conditions of this MSA, the waiver of any term or condition of this MSA, or the granting of an extension of time for performance, will not constitute a permanent waiver of any term or condition of this MSA, and this MSA and each of its provisions will remain at all times in full force and effect until modified by both Parties in writing.

7.3 **Amendment and Modification.** This MSA shall not be valid until signed and accepted by a signatory duly authorized to legally bind the Parties hereto. No change, amendment, modification, termination or attempted waiver of any of the provisions set forth herein shall be binding unless made in writing and signed by a duly authorized representative of both Parties hereto, and no representation, promise, inducement or statement of intention has been made by either Party which is not embodied herein.

7.4 **Assignment.** The Customer will not assign this MSA or any rights under this MSA without the prior written consent of Netagen. Subject to the foregoing, this MSA will be binding upon and inure to the benefit of the Parties hereto and their respective successors or assigns.

7.5 **Notices.** Any notice required by this MSA or given in connection with it, shall be in writing and shall be given to the appropriate party by personal delivery or by certified mail, postage prepaid, or recognized overnight delivery services, at the address of each Party as first set forth above, and as may be amended from time to time by each Party with notice to the other Party.

7.6 **Jurisdiction; Arbitration.** This MSA and the relationship between the Parties hereto will be governed by the laws of the Province in which the Service(s) are being sold. Any dispute regarding the interpretation, compliance with or breach of this MSA will be negotiated in good faith between the parties commencing upon written notice from one party to the other containing a summary of the dispute (the “Dispute Notice”). If the

dispute is not resolved by negotiation within twenty (20) days following receipt of the Dispute Notice, the parties will refer the dispute to a mediator acceptable to both parties for non-binding mediation. The costs of mediation shall be shared equally by the parties. If the dispute is not settled by mediation within sixty (60) days of receipt of the Dispute Notice, or if a mutually acceptable mediator is not selected within thirty (30) days of receipt of the Dispute Notice, the dispute shall be settled by binding arbitration in accordance with the provisions of the *Arbitration Act* (Ontario). The arbitration proceeding will take place in Ottawa, Ontario and will be conducted in the English language, by a single arbitrator, should the parties agree to one. Otherwise, the arbitration panel will consist of 3 arbitrators, one (1) arbitrator appointed by each party and a third neutral arbitrator appointed by the two (2) arbitrators designated by the parties. The arbitral award will be the exclusive remedy of the parties for all claims, counterclaims, issues, or accountings presented or plead to the arbitrators. The costs of arbitration, including legal fees and disbursements of the parties, shall be allocated by the arbitrator in the manner that the arbitrator, in his or her discretion, considers appropriate. This section does not affect the rights of the parties to seek injunctive relief when appropriate to enforce their respective rights hereunder.

7.7 **Severability.** In the event a court of competent jurisdiction determines that any part or provision of this MSA is invalid or unenforceable, such determination shall not affect the validity or enforceability of any other part or provision of this MSA.

7.8 **Counterparts; Photographic Copies.** This MSA may be executed in counterparts, each of which shall be deemed an original, but all of which taken together will constitute one and the same instrument. In addition, a facsimile or photographic copy of a party's signature or this MSA shall be deemed an original thereof.

7.9 **Entire Agreement; Order of Precedence**. This MSA, including any Schedules attached hereto, sets forth the entire agreement and understanding of the Parties hereto and supersedes and merges any and all prior proposals, negotiations, representations, agreements, arrangements or understandings, both oral and written, relating to the subject matter hereof. Unless specifically agreed to otherwise, in case of a conflict between any of the terms and conditions in this MSA and any other terms and conditions in any Schedule or Netagen work order for additional Customer work (the "Service Order"), the order of precedence shall be: this MSA, any Schedule, and any Service Order. For the avoidance of doubt, any purchase order sent to Netagen by the Customer (for the Customer's administrative purposes or otherwise) shall not be binding.

7.10 **Force Majeure.** Netagen shall not be responsible or liable for any damages, whether direct, indirect, consequential, incidental, foreseeable or unforeseeable, arising out of, in connection with or relating to any matter occasioned by or due to fire, flood, water, the elements, acts of God, war and threat of imminent war, labor disputes or shortages, utility curtailments, power failures, explosions, civil disturbances, governmental actions, shortages of equipment or supplies, unavailability of transportation, acts or omissions of third parties, or any other cause beyond either Party's reasonable control.

IN WITNESS WHEREOF the Corporations have hereunto authorized the execution of this MSA as evidenced by the respective signature of their duly authorized officer in that behalf as of the date indicated.

NETAGEN COMMUNICATION TECHNOLOGIES INC.	CUSTOMER
Per: _____	Per: _____
Name:	Name: Christian Provenzano
Title:	Title: Mayor
	Per:_____
	Name: Madison Zuppa
	Title: Deputy City Clerk

COMMANDER 911 SERVICE SCHEDULE

This END USER NETAGEN COMMANDER 911 SERVICE SCHEDULE (this "Schedule") is made between NETAGEN COMMUNICATION TECHNOLOGIES INC. (hereinafter "Netagen"), located at 236 Westbrook Rd, Carp, Ontario K0A 1L0 and The Corporation of the City of Sault Ste. Marie located at 99 Foster Dr, Sault Ste. Marie, ON P6A 5X6 ("Customer") as of this 31th day of May, 2022 (the "Effective Date"), and incorporates and is governed by the terms and conditions of the Master Services Agreement (the "MSA") entered into by the parties. Any terms used herein and not defined herein shall have the meaning given to such terms in the MSA. This Agreement for Netagen's NETAGEN COMMANDER 911 Service ("Service") provided to Customer governs only the NETAGEN COMMANDER 911 Service and excludes any equipment, such as a desktop computer, laptop, or smart phone ("Equipment") used in conjunction with the Service.

This Schedule describes the deliverables, the parties' respective responsibilities and other conditions applicable for the provision of products, professional services and managed services by Netagen for Customer. No obligation to provide any of the services described herein arises unless a purchase order (PO) for such Service, incorporating the terms of this Schedule, has been placed by Customer and accepted by Netagen. Netagen's performance of the services described in this Schedule is subject to the assumptions, exclusions and other conditions identified in this document.

1 Service Description

The Commander 911 solution is Netagen's ESM (Emergency Services Management) portfolio for Canadian PSAP's (Public Service Answering Points). This Service Schedule describes the initial design, deployment, integration, and testing services required to put the solution into a production environment. Following this initial "go-live" activity, this Schedule describes the on-going management, maintenance, and support of the solution by Netagen for the contracted period.

The Netagen Commander 911 Service includes the following managed service components:

- Project Management
- Design, Implementation, Testing
- Training
- System Administration
- Network Operation Center (NOC) Support
- Updates
- Security
- Reporting
- Service Management

1.1. Project Management

1.1.1. Netagen Responsibilities

Throughout the deployment of the Netagen Commander 911 managed service, Netagen will provide technical project management. The project manager will be the overall program lead and be responsible for coordination of all services, setting up a working model between Netagen and Customer primes, and detailed project planning.

The Netagen project manager will produce a detailed project plan identifying timeline, key stakeholders, scope, project communication, change control and quality management. The Netagen project manager will also be the lead point of contact for the Customer and will work with Customer primes to coordinate activities to ensure that the project deployment proceeds according to the agreed schedule. Customer-specific requirements will be scoped and defined as necessary.

Key responsibilities of the Netagen project manager include:

- Coordination of requirements gathering
- Status updates
- Managing status meetings
- Coordination of product delivery
- Managing of Project Plan
- Risk Mitigation
- Assignment of Technical Resources

A sample project plan is included in Appendix D, detailing the typical activities to be included in a Customer-specific project plan.

1.1.2. Customer Responsibilities

Customer will provide a project manager to serve as an interface between Netagen and Customer, and to provide Customer input for milestone dates, project management plan and schedule.

The Customer Project Manager will identify technical and/or functional primes for the following areas:

- Network engineering
- Security
- Operations
- IT systems and processes

For an efficient and optimized deployment of the solution, Netagen will work closely with the Customer project manager and primes in the planning and execution phase of each service.

1.2. Design / Implementation / Testing

1.2.1. Netagen Responsibilities

The Netagen solution design experts will identify the unique requirements of Customer to plan the smooth deployment of the Netagen Commander 911 solution. Customer requirements will be related to aspects including but not limited to networking, application configuration, security, and resiliency. The Design/Implementation/Testing service may include the following components, depending on specific customer requirements:

- Discovery sessions with the Customer's staff for deep-dive requirements scoping
- Requirements Analysis
- One-time network assessment prior to deployment of the solution, specifically covering the switches hosting the Commander 911 solution to the switches hosting the NG9-1-1 workstations. Remediation of discovered issues is the responsibility of the Customer
- Network Design – ensure the goal of a tailored and optimized solution that fits precisely with the capacity, call routing, security, redundancy, and performance requirements
- Deployment planning per location – ensuring a strategy to minimize deployment risks and meet business goals, while avoiding costly delays during the deployment, integration, and go-live phases, including phased migration from a legacy solution
- Integration Planning – planning for properly connecting and configuring the Netagen Commander 911 Solution, including risk-related recommendations (i.e., risk management)
- Test Planning – building customized test plan, based on Customer requirements, ensuring the success of the solution implementation
- Site Implementation Questionnaires – creating and generating customized Site Questionnaires as necessary
- Test execution, including application, integration, and customer acceptance testing

The Engineers assigned to Customer under this service will perform assigned activities during day-time hours, Monday through Friday, for a total of eight hours per day, five days per week, excluding Netagen's designated holidays.

The Engineer's daily work hours will be similar to Customer's work hours at the assigned work location.

The Engineer will comply with Customer's security requirements while on the Customer premises.

1.2.2. Customer Responsibilities

Provide Netagen with all relevant service and technical requirements prior to service commencement in a timely manner.

Grant the Engineer reasonable access to Customer's facilities that are required to perform the assigned activities.

Respond to Netagen's technical questions and inquiries for information in a timely manner. Netagen requires turnaround on technical requests within 24 hours.

Provide knowledgeable personnel to review and approve the design and installation procedures as described in this Service Schedule, in accordance with a schedule to be developed between Netagen and Customer.

Remediation of any issues discovered during the pre-deployment network assessment performed by Netagen.

Maintain minimum standards required for services:

- A Data Cabinet is required to house the Netagen Commander 911 solution components with up to 6Us of space and must be stored under the following environmental conditions:
    - Temperature: Operating 5°C to 40°C (Storage -40°C to 70°C)
    - Relative Humidity: Operating 10% to 90% (Storage 5% to 95%)
    - No flammable materials in the area
    - No possibility of flooding
    - No other machinery or equipment blocking access
    - Not an excessively dusty atmosphere
    - Area is unlikely to suffer rapid changes in temperature and humidity
    - Must not be in proximity of strong magnetic fields, sources of radio frequency and other electrical interference
    - All Server and Desktop Software must be Genuine, Licensed and Vendor-Supported

Costs required to bring Client's environment up to these minimum standards are not included in this Agreement.

1.3. Training

1.3.1. Netagen Responsibilities

Netagen will provide a detailed plan for each of the training types as part of the project deliverables. This will include administration training, basic technical troubleshooting as well as end user training sessions. Training plans need to be created in conjunction with the customer team to ensure that it meets their specific needs.

Training categories include:

- Service Portal training / Onboarding – System Administrators
- Telephony Administration – Set moves, adds, and feature changes
- User training – Hard Phones
- Agent Console training – End user training at each PSAP
- Supervisor Console training – PSAP Supervisors at each PSAP
- Reporting – Administrators and Supervisors
- Wallboard editor training (provided if wallboards are included)

Training sessions may either be delivered on-site or remotely (to be confirmed by project manager by mutual agreement between Netagen and Customer).

1.3.2. Customer Responsibilities

For on-site training (where applicable), Customer agrees to provide the necessary classroom space, along with associated technology required for training (display screen, network connectivity, access to the Commander 911 solution as deployed on Customer site for demonstration purposes, etc.).

1.4. System Administration

Netagen's highly skilled technicians will provide a full range of system management activities to manage every aspect of the solution.

1.4.1. Call Handling Functional Element (CHFE) Infrastructure

Netagen will provide the system administration of the following CHFE infrastructure components:

- Avaya SMGR – system management portal
- Avaya CM – PBX
- Avaya SM – SIP call routing
- 3rd Party Recording interface (TSAPI/DMCC interface)

1.4.2. Moves, Adds, Changes

Customers can request MAC activities by opening a service ticket with Netagen. MAC activities will be scheduled/performed via the Netagen NOC and will be queued where possible for efficiency (typically within 24 hours).

1.4.3. Border Control Function (BCF)

Netagen will provide the system administration of the following Netagen provided BCF infrastructure components:

- Firewalls
    - Configure BFD, BGP
    - Configure QoS as per carrier UNI documentation
    - Configure firewall in HA (terminated to customer)
    - Non-service impacting changes (driven by carrier) – every 2 months
    - Service impacting changes – as required
    - Changes required for regular uptime/out of necessity are included, other changes are billable
- Session Border Controllers
    - Configure Transcoding/Transrating
        - Codecs required by CRTC 2019-353:
            - G.711 (A-law and μ-law), Adaptive Multi-Rate Audio (AMR), AMR-(wideband) WB, Opus (narrowband and wideband)
            - G.722, G.729 (optional but recommended)
            - Video (currently out of scope)
    - Non-service impacting changes (driven by carrier) – every 2 months
    - Service impacting changes – as required
    - Changes required for regular uptime/out of necessity are included, other changes are billable

1.4.4. Server Infrastructure / VMware

Netagen will provide the system administration of the Netagen provided HPE Server and VMware infrastructure components.

1.4.5. i3 Call Interface and Agent Console

Netagen will provide the configuration and break-fix system administration of the following i3 Call Interface and Agent Console components:

- i3 call interface (mandatory)
- Agent console (mandatory)
- KomApps (mandatory)
- KomLog (optional)
- UCMS - unanswered call management system (optional)
- SMS mass notification (optional)
- RTT (included)
- Omnibox
- Dry contact for radio headset integration

1.4.6. Database Maintenance

Netagen will monitor the SQL database to ensure optimal performance. Integrity checks and rebuild/reorganize tasks will be performed as required.

1.4.7. Backup and Restore

In addition to the redundancy and reliability inherent in the design of the Commander 911 solution, key system configuration information is also backed up as a safeguard.

- SMGR/SM – weekly
- CM – weekly
- CMS – weekly
- AES – after configuration changes
- SBC/EMS – weekly
- Komutel core apps
- SQL – daily
- Geomant
- Check Point – after configuration changes

1.5. Netagen Network Operations Centre (NOC)

1.5.1. Operational Services

Operational Services (following deployment) includes continuous monitoring and maintenance support by the Netagen Network Operations Center (NOC).

Netagen provides proactive, remote monitoring and network surveillance 24 hours a day, seven days a week. This service includes monitoring, detection of alarms/events and remote fault resolution and management.

- Service Availability Monitoring
- Event Log Monitoring
- Key Metric Monitoring (Drive Space, CPU, Memory, Disk IO and Page File)
- Service Desk available 24x7 (24 hours a day, 7 days a week)
- Handle and resolve remotely product-related problems
- Handle and resolve issues on-site if remote resolution is not possible; issues outside the scope of the Commander 911 Solution will be billed separately
- Restoration of service (where impacted) due to service malfunction, including workaround solutions
- Ongoing collection of logs/traces from each managed application/device to enable prompt Incident management
- Provide status updates to Customer; follow up status until problem is closed
- Alarm email notification enables Customer to be made aware at the same time as Netagen NOC of network alarms in the Customer's environment
- Service Impact Root Cause Analysis for instances of total system outage

Trouble diagnosis and repair for problems not due to the fault of NETAGEN COMMANDER 911 Service will be charged per published labour rates, with a one-hour minimum. Such problems may include local LAN network problems, customer owned equipment such as routers and firewalls, or Internet Service Provider (ISP) related problems.

Netagen also reserves the right to charge professional service fees for work not covered under this agreement, and in consultation with the customer; see Appendix C for published labour rates.

1.5.2. Omni-Channel Trouble Ticket Creation

Netagen's NOC enables the Customer to create a service order by email, web, or telephone.

Tickets may be opened by both Netagen (driven via proactive monitoring) and Customer should they observe an issue.

1.6. Updates

1.6.1. Firmware and Patch Management

Netagen, upon notice from OEM's of new software patches and/or security vulnerabilities, validates if they are applicable to the Commander 911 solution and then works with the customer to provide recommendations, and schedules the implementation of the required patches.

Patching frequency will be bi-annually; however, security fixes will be applied as soon as possible if they are capable of a privilege escalation exploit as advised by OEM support team.

Customers requiring patching on a more frequent basis can action a change request to the contract or can opt for a professional services engagement.

1.6.2. Customer Responsibilities

Workstation patching is the responsibility of the customer.

Windows Environment:

- Critical security patching will include monthly cumulative security patches for Windows & security patches
- Ongoing software and security updates shall be checked monthly and patched as required by the vendor, and updated more frequently as required (depending on customer's group policy)

1.7. Technology Refresh

Netagen managed hardware may be refreshed after 60 months to ensure the latest feature functionality is available and the chance of hardware failure and service outage is minimized (eligible when term is renewed for an additional 60 months).

1.8. Security

1.8.1. Netagen Security Infrastructure

The Netagen NOC located in Ottawa Ontario Canada is a government cleared facility designed to operate within the ITSG-33 Security Framework.

All Netagen NOC technicians are required to obtain a “Secret” level security clearance and where required obtain unique locations-based security certifications.

Multi-factor authentication is implemented on OEM and Netagen Portals.

1.8.2. User Account Administration

Netagen works with the end customer to ensure only users who should have access to systems and support portals have access.

1.8.3. Security Administration

Netagen will ensure that all security privilege escalation related content is applied as soon as approved by the OEM.

Role Based Access Control (RBAC) rules are applied to both the server O/S's and applications to ensure access is limited and all default user accounts and passwords are changed.

All default accounts are demoted or removed where possible and new unique accounts are created with strong passwords.

1.8.4. Antivirus Software

Commander 911 solutions are deployed with the latest anti-virus protection installed and kept up to date for the duration of the contract (limited to Netagen Windows servers).

1.9. Reporting

1.9.1. Call Centre Reporting

Commander 911 provides over 200 real-time and historical standard management reports. Netagen will assist the customer in locating the standard reports that meet their business needs. If in the case that the standard reports do meet fully meet the customer requirements, the additional reporting capabilities can be addressed and will be billed at the then-current Netagen rates.

1.9.2. Quarterly Reporting

Netagen will provide Customer with quarterly reporting detailing resolved tickets, SLA performance, assets under contract, and service availability.

1.10. Service Management

1.10.1. Annual Service Review

Netagen provides an annual meeting with clients to review ongoing issues, go over upcoming project work, discuss changes in vendors, advise on best practices, create budgets, and plan the technology roadmap for the next period.

1.10.2. Quarterly Service Reviews

Netagen provides quarterly meetings with clients to review ongoing issues, go over upcoming project work, discuss changes in vendors, advise on best practices, create budgets, and plan the technology roadmap for the next period.

1.10.3. Designated Service Manager

To ensure consistency of the service engagement, Netagen will provide a designated Service Manager. The Service Manager is Customer's single point of contact for all questions and services regarding the Managed Service.

1.10.4. Customer Responsibilities

While Netagen is providing management of the system, there are a few tasks that customers will be responsible for. Ongoing customer responsibilities include:

- Maintaining customer data networks (WAN/LAN)
    - Maintaining customer network connectivity to the solution cores
    - Provide dual data switches with capability for distributed link aggregation (multi-homing)
- Maintaining customer workstations and PCs
    - Assisting with the LRA process (removal or addition of new agents)
    - Loading of certificates onto PCs and workstations
    - Providing agent headsets
- Managing and updating of Agent resource directory (as required)
- Training of additional Agents and staff members
- CAD
- Loggers (call recording)
- Radios
- Call reconstruction for incident reviews
- Opening service tickets if any issues are identified at a PSAP location
- Providing remote access at each PSAP (VPN, TeamViewer, Rescue.Me, etc.)
- Providing an on-site chaperone (if required)
- Wallboards
    - Providing displays
    - AV materials required for installation (HDMI splitters, cables, mounts, etc.)
    - Mounting of wallboards (if required)
    - PC to drive wallboard display

- Backup targets and storage
- Uninterruptible power supplies for each server are required
- Generator backup (recommended)

1.11. Change Management

1.11.1. Change Management Description

The pricing in this Schedule is based upon performance of the tasks and provision of deliverables specifically defined in this document. Requests for additional work activities that are not described in this document are subject to acceptance by Netagen and may entail additional charges to Customer. Certain matters may require a new quotation under a separate Schedule. If Netagen agrees to perform additional work activities under a Schedule, Customer shall execute a Change Order in accordance with Netagen's Change Management Process to confirm the schedule impact and Netagen's authorization to perform and bill for such work activities.

Additional charges may apply if performance or completion of the Service is delayed for any reason attributable to Customer. In such cases, Customer agrees to authorize: (a) Netagen's billing for such work activities on a time and material basis at Netagen's then current standard rates and subject to any applicable per incident and/or minimum hourly billing requirements then in effect and/or (b) the schedule extension attributable to the delay.

1.11.2. Change Control Process

The Change Control Process is an element of the Contract, agreed to by both Netagen and Customer. It will be the only authorized mechanism to request and approve changes. The authorized person(s) to request and/or approve changes will be identified in writing by both parties. All work identified and performed through the Change Control Process will be governed by the terms and conditions of the subject Agreement between Customer and Netagen.

The Netagen Project Manager is responsible for communicating and explaining the Project Change Control Process to Customer Project Representatives and the Netagen Project Team, as well as other involved parties, such as third-party vendors.

The following Change Request process will be followed:

- To initiate a change, the Customer and Netagen Project Managers will jointly prepare a Change Request Form,
- The Project Manager will review the Change Request for impact on Scope, Schedule, Cost, Resources, and Commercial/Contract status,
- The Project Manager will direct the Change Request to the appropriate Netagen Program Team members i.e. Engineering, Installation, Contract Manager, etc., to evaluate the impact of the change,
- The Project Manager will submit the proposed change to a joint Customer/Netagen Change Control Board for determination of whether the change should be approved or rejected. The Customer/Netagen Change Control Board will consist of the Customer and Netagen Project Managers and the Netagen Services Manager,

A rejected Change Request will be documented as to the details and rationale for rejection,

An approved Change Request is the authorization to start the work and authorization for Netagen to invoice for such work, as required. Customer's signature on the form certifies that the individual signing has the authority to authorize the work requested and the additional cost and payment. Payment of such invoices will be pursuant to the Master Services Agreement between Customer and Netagen.

2 Price List

Pricing for NETAGEN COMMANDER 911 Service is provided in Appendix A (attached). By signing this Service Schedule, Customer agrees to pay in full all charges, whether the customer has issued a formal purchase order to cover the charges.

3 General terms

Unless otherwise stated in previous sections of this Schedule, the following terms apply to all Services. Additional terms and conditions are per the Agreement.

Any service, unless explicitly described in this Schedule, is not included.

3.1. Conditions

Netagen reserves the right to determine which personnel to assign to perform Services. Netagen personnel shall at all times be subject to the employment conditions of Netagen and not those of Customer. If Netagen personnel are present on Customer's premises, those Netagen personnel shall respect Customer's on-site conditions.

All work will typically be performed during normal business hours – 8 AM to 5 PM, local time, Monday through Friday - unless different working hours/schedule have been specified elsewhere in the Schedule.

Netagen may use proprietary tools and software for providing the Service set forth in this Schedule. The stated price for the Services does not include the sale, licensing or transfer of such tools or software or developed works to Customer; however, the pricing for the Services does include use of such tools and software in connection with the performance of the Services hereunder. Nothing herein shall be construed as granting Customer any rights, express or implied, including without limitation any intellectual property rights, developed processes, copyrights, patent rights, business methods, tools, methodologies, processes, techniques, solution associated with any ideas, concepts, techniques, inventions, processes or works of authorship developed or created by Netagen or any Consultant pursuant to this Schedule.

During the term of this Schedule (including any extensions) and for one year after termination or expiration of this Schedule, Customer shall not, except with Netagen's prior written consent, solicit for employment Netagen employees performing Services under this Schedule. This shall not restrict

Customer from placing employment advertising in trade or general media or from using recruiters provided that such advertising and recruiters do not target Netagen employees.

3.2. Acceptance

Upon completion of Services, the Netagen Project Manager will issue a notice of completion and "Customer Acceptance" document. Customer will have ten (10) business days (Inspection Period) to review documentation and to perform inspection of Services. At the conclusion of the Inspection Period, where no deficiencies are encountered, Customer shall execute (sign) the Customer Acceptance and return to the Netagen Project Manager. Upon execution of the Customer Acceptance Netagen shall issue the Service Commencement Notice as per clause 2.1 of the MSA.

If during the Inspection Period, Customer finds the Services to be non-compliant with this Schedule or mutually agreed acceptance standards, Customer will notify the Netagen Project Manager in writing. Netagen will remedy any mutually agreed upon non-conformance and notify Customer of completion of such remedies. Upon concurrence and acceptance of such remedies, Customer shall execute (sign) the Customer Acceptance and return to Netagen.

Completed Services shall be considered Accepted unless the Netagen Project Manager receives written Customer notification to the contrary within ten (10) business days from the issuance of the notice of completion.

3.3. Loss of Service Due to Power Failure or Network Service Outage or Termination or Suspension or Termination by Netagen

The Netagen Commander 911 Service is designed to be resilient, within the components provided and managed by Netagen. However, Customer acknowledges and understands that the Service may not function in the event of issues outside the demarcation between the Commander 911 solution and the Customer's environment. Conditions that could result in service outages or service limitations include:

- Power failure (unless the Customer has a power generator on site to deal with power failures).
- Outage of customer provided network components, or termination or failure of service with or by Customer's network provider and/or broadband provider

In the even of an outage due to issues outside the Netagen solution, Customer will continue to be billed for the Service unless and until Customer terminates the Service in accordance with this Agreement.

Should Netagen suspend or terminate Customer's Service, the Service will not function until such time as Netagen restores Customer's Service (which may require payment of all invoices and reconnection fees owed by Customer and/or cure of any breach by Customer of this Agreement).

3.4. Use of Service by Customers Outside Canada

Netagen does not offer NG911 emergency services outside of Canada. If the Customer uses the Services in a country other than Canada, the Customer does so at the Customer's sole risk, including the risk that such activity violates local laws and that NG911 emergency services are unavailable. The Customer is liable for any and all charges, fees, fines, taxes, regulatory charges or penalties resulting from use of the Service outside of Canada by the Customer's use of the Service, directly or indirectly, and indemnifies and holds Netagen harmless from and against any and all liability for any such use. Netagen does not guarantee that the Service will operate outside of Canada.

4 Entire Agreement

Any modification or addition to this Schedule shall be in writing and signed by authorized representatives of both parties. Each party intends that a facsimile of its signature printed by a receiving fax machine, and/or a signature scanned in a PDF document, be regarded as an original signature and agrees that this Schedule may be executed in counterparts, which together shall constitute a single instrument.

IN WITNESS WHEREOF, the parties have caused this Schedule to be executed by their duly authorized representatives on the date(s) indicated.

Netagen		**Customer**	
Name:		Name:	Christian Provenzano
Title:		Title:	Mayor
Signature:		Signature:	
Date:		Date:	

Name: Madison Zuppa

Title: Deputy City Clerk

Signature: _____

5 Appendix A – Pricing

Any change to this agreed upon Pricing Appendix will require an amendment. The Fixed Term Contract period is 60 months.

5.1. Managed Service Charges

5.1.1. Primary Site

Subscription	Quantity	Unit Cost (Monthly)	Total (Monthly)
Site Price	1	$10,500	$10,500
Agent Price	5	$400	$2,000
		Subtotal	$12,500

5.1.2. Secondary Site (Disaster Recovery Location)

Subscription	Quantity	Unit Cost (Monthly)	Total (Monthly)
Site Price	1	$9,500	$9,500
Agent Price	3	$400	$1,200
		Subtotal	$10,700

5.1.3. Admin Phone System

Subscription	Quantity	Unit Cost (Monthly)	Total (Monthly)
User Price			
		Subtotal	

5.1.4. Monthly Summary

Subscription	Monthly
Primary Site (Site + Users)	$12,500
Secondary Site (Site + Users)	$10,700
Admin (Users)	
Total Monthly	$23,200

5.1.5. Contract Total Summary

Subscription	Monthly	Term	Extended
One Time – Contract Initiation	$25,000	1	$25,000
Primary Site (Site + Users)	$12,500	60	$750,000
Secondary Site (Site + Users)	$10,700	60	$642,000
Admin (Users)		60	
Contract Value			$1,417,000

6 Appendix B – Service Levels

Netagen will provide Support Services in accordance with the following Service Levels for the Eligible Products detailed herein that are covered under this Netagen Commander 911 Service Schedule. These Service Levels are restricted and applicable only to those Eligible Products at the eligible location indicated in this Service Schedule. All requirements specified herein must remain continuously in place for Service Level eligibility.

Eligible Products:

- Netagen Commander 911 Service
- Netagen Provided MPLS Circuit(s) for the Netagen Commander 911 Service
- Netagen Provided Session Border Controller(s) for the Netagen Commander 911 Service
- Netagen Provided Optional Components for the Netagen Commander 911 Service

Where an incident is proven to be a component of the solution not covered under eligible products such as an Internet circuit or customer LAN issue, the Service Levels indicated in this Appendix do not apply.

6.1. Managed Service Response Times

Trouble	Priority	Response Time 24/7/365
Service not available (all users and functions unavailable. Ex: Unable to take calls / system down).	**1 CRITICAL**	Remote within 15 min On-Site within 2 hours
Significant degradation of service (large number of users or business critical functions affected).	**2 MAJOR**	Remote within 30 min On-Site within 4 hours
Limited degradation of service (limited number of users or functions affected, business process can continue).	**3 MINOR**	Remote within 4 hours On-Site within 24 hours

- Clients may request a specific technician however Netagen will at its discretion assign a technician to address a service ticket or project work

- Netagen reserves the right to allow its NOC (Network Operations Center) to address all tickets initially. If the NOC cannot resolve a ticket, it will be escalated to a Tier 3 or Tier 4 technician.
- Support outside of contracted hours requiring on-site will incur an additional charge at Netagen's then hourly rate for service
- On-site response times are applicable for sites within 100km from a Netagen office
- Client agrees that weather, traffic conditions or Force Majeure outside the control of Netagen may extend or prevent remote or onsite response.
- In order to allow Netagen to properly support the Customer, physical access to the supported environments may be required for a mutually agreed duration

6.2. Managed Service Restoral Time

Restoral time is the time it takes for Netagen to receive notification of an event, acknowledge the event by means of an email with the service order number and restore service to the end customer or provide an acceptable workaround. Restoral time is from the time Netagen is made aware of a service incident either through monitoring or a customer-initiated service order.

- For all Critical incidents, the Netagen restoral time is 3 hours or less
- For all Major incidents, the Netagen restoral time is 6 hours or less
- For all Minor incidents, the Netagen restoral time is 24 hours or less

6.3. Requirements for SLA Eligibility

The following requirements must be met and maintained to qualify for SLA's:

- Customer must have an active Netagen Commander 911 signed contract
- All incidents must be reported through the Netagen Network Operation Centre (NOC)
- The customer account must not be in arrears

7 Appendix C – Labour Rates

Labour Rates for Maintenance Contracted Customers			
Business Day (Mon-Fri 08:00 -17:00)			
Function	Part #	Hourly Rate	Minimum Charge
UC Remote Support	CNV-CON-RMACBH	$110	.5hr
UC Technician	CNV-CON-STBH	$120	1hr
Advanced UC Specialist	CNV-CON-ATBH	$160	1hr
Application Specialist	CNV-CON-ASBH	$175	1hr
Contact Center Specialist	CNV-CON-CCBH	$215	1hr
Design & Engineering Support	CNV-CON-TSBH	$264	1hr
Project Management	CNV-CON-PMGTBH	$175	1hr
Local Service Fee	CNV-CON-SFBHIN	$75	Every Billable SO
Outside Local Area Service Fee	CNV-CON-SFBHOT	$100	Every Billable SO
Non-Business Day Mon-Fri 17:00 to 07:59 and Weekends			
Function	Part #	Hourly Rate	Minimum Charge
UC Remote Support	CNV-CON-RMACNBH	$165	1hr
UC Technician	CNV-CON-STNBH	$182	2hr
Advanced UC Specialist	CNV-CON-ATNBH	$239	2hr
Application Specialist	CNV-CON-ASNBH	$262	2hr

Contact Center Specialist	CNV-CON-CCNBH	$321	2hr
Design & Engineering	CNV-CON-TSNBH	$396	2hr
Project Management	CNV-CON-PMGTNBH	$272	1hr
Local Service Fee	CNV-CON-SFNBHIN	$75	Every Billable SO
Outside Local Area Service Fee	CNV-CON-SFNBHOT	$100	Every Billable SO
Statutory Holidays			
Function	Part #	Hourly Rate	Minimum Charge
UC Remote Support	CNV-CON-RMACBH	$220	4hr
UC Technician	CNV-CON-STBH	$242	4hr
Advanced UC Specialist	CNV-CON-ATBH	$319	4hr
Application Specialist	CNV-CON-ASBH	$351	4hr
Contact Center Specialist	CNV-CON-CCBH	$429	4hr
Design & Engineering Support	CNV-CON-TSBH	$396	4hr
Project Management	CNV-CON-PMGTBH	$363	4hr

7.1. Labour Item Descriptions

7.1.1. Remote Mac Work (UC Remote Support)

This rate is used for basic MAC work i.e., feature key changes, programming of new phone, adding a mailbox, basically any basic work that can be performed remotely.

7.1.2. Basic MAC Technician (UC Technician)

This rate is used for onsite basic move add and change work and basic repair work i.e., replacing a set not covered under warranty. For example, moving a phone, making a feature key change on a phone, adding a mailbox. Basically, anything that a junior tech can complete. Choosing of this labour item requires you to apply the applicable service fee.

7.1.3. Advanced UC Technician (Advance UC Specialist)

This rate is used for any advanced work such as patching, firmware upgrades, changes to system resources such as trunks, routes, upgrades and applies to all systems such. This rate also applies to billable repair work where the repair is outside what is covered under the Basic MAC technician description. If onsite work is required, and is not part of a project, choosing this labour item requires you to apply the applicable service fee.

7.1.4. Application Specialist (Software Application Specialist)

This rate is used for application programming like advanced administration, application development, etc. If onsite work is required, and is not part of a project, choosing this labour item requires you to apply the applicable service fee.

7.1.5. Contact Centre Specialist (AACC, ACCS and Elite)

This rate is used for Contact Centre application design, scripting, testing and anything other than physical server work i.e., patching. For example, if the site required the latest patches, then the Advanced Technician rate would apply for the installation of the patches. If advanced testing was required (other than verifying the services are up) then the Contact Centre Specialist rate would apply of the time spent on testing. If onsite work is required, and is not part of a project, choosing this labour item requires you to apply the applicable service fee.

7.1.6. Design/Engineering Support

This rate is used for design services and where a designer is required to get involved in a billable customer issue. An example of this involvement would be where advanced network troubleshooting is required and the customer requires Netagen assistance. As this labour item will rarely require an onsite visit an associated service fee should not be required. If onsite work is required, and is not part of a project, choosing this labour item requires you to apply the applicable service fee.

8 Appendix D – Sample Project Plan

The following includes the typical activities to be outlined in a Customer-specific project plan:

Activity	Lead	Support
Initiation Activities		
• Internal Debrief	Netagen	
• Project Kick-Off Call	Netagen	Customer
IP Workbook Activities - Customer Provided		
• Network review - calling requirements, QoS	Netagen	Customer
• Review Intelligent Workbook, including IP addressing schema, VLANs, DHCP scopes	Netagen	Customer
• Receive Completed IP Workbook with IP's	Netagen	Customer
• Review Final Design – Overall	Netagen	Customer
Customer Activities		
• Provide update on Server Rack Space	Customer	
• Complete IP Workbook	Customer	
• Provide Floor Plan - with identified stations	Customer	
Solution Design & Planning Activities		
• GUI Design Session	Netagen	Customer
• Technical Design Considerations	Netagen	
• Directory meeting - Scope review and high-level planning	Netagen	Customer
• Deliver Technical Requirements Document	Netagen	
• Complete Directory Spreadsheet	Netagen	
• Provide List of Local Numbers which will reside on Komutel system (Directory numbers - Key Layout) - request form Telco	Netagen	Customer
• Requirements analysis [Komutel releases technical requirements to client]	Netagen	
• Explanation of search capability vs spreadsheet columns	Netagen	
• Review and update planning	Netagen	
• Komutel Discovery meeting data directory	Netagen	Customer
• Deliver Komutel Requirements Workbook Documentation	Netagen	
• Return Komutel Requirements Workbook Documentation	Netagen	
• Directory meeting - Review and final decision	Netagen	Customer
Avaya Solution Design		
• Initial Overview workshop	Netagen	Customer
• Review software design elements	Netagen	
• Review dial plan (ARS) elements	Netagen	
• Document call flow design	Netagen	
• Customer review of design decisions	Netagen	Customer

• Review final design with customer	Netagen	Customer
• Signoff of Dial Plan Design	Customer	Netagen
• Signoff of Avaya Design	Customer	Netagen
Server Infrastructure Build		
• Build SQL & operating systems	Netagen	
• Build VMWare Servers	Netagen	
Avaya Hardware Activities		
• Staging and Delivery - Netagen Lab	Netagen	
• Order hardware	Netagen	
• Delivery of Equipment	Netagen	
• Dry Contact Delivery	Netagen	
• Inventory of equipment delivery	Netagen	
• Inventory, Unpack, Rack and Load OVA's, Download license file	Netagen	
• Stage Equipment in Netagen Lab	Netagen	
• Build Avaya Servers	Netagen	
• Build SBC (for 2ESinet & 2 SBC PSTN Connection)	Netagen	
• Build Firewall build (dual firewall for BCF border control function (dual SBC & dual firewall)	Netagen	
Customer Site Activities		
• Environment Readiness - Network, Servers, Remote Access	Customer	
• Load OVA's	Netagen	
• Apply latest patches and firmware updates	Netagen	
• Program IP's as defined during design stage	Netagen	
• Apply design settings and timers as per design documentation	Netagen	
• Program ARS and dial plan information	Netagen	
• Register on Avaya GRT	Netagen	
• Perform basic testing	Netagen	
• Equipment ready for shipment	Netagen	
• Racking & Stacking of servers and gateways at Customer Site & Integration Testing	Netagen	
• Phone Deployments on Desks	Netagen	
SIT911 GUI Layout		
• Directory meeting #1 - Scope review and high-level planning	Netagen	Customer
• Directory meeting #2 - Requirements analysis [Komutel releases technical requirements to client]	Netagen	Customer
• Directory meeting #3 - Explanation of search capability vs spreadsheet columns	Netagen	Customer

• Directory meeting #4 - Review and update planning	Netagen	Customer
• Directory meeting #5 - Komutel Discovery meeting data directory	Netagen	Customer
• Directory meeting #6 - Komutel Plugin Discovery	Netagen	Customer
• Directory meeting #7 - Review and final decision	Netagen	Customer
• Subsequent Design Meeting	Netagen	Customer
• GUI Layout - Review Changes and Update	Netagen	Customer
SIT2 Komutel Server / Database / Directory		
• SQL server installation	Netagen	
• Deliver Template for Directory	Netagen	
• Provide Directory files	Netagen	
• Provide file path of directory(ies)	Netagen	
• Komsync installation + configuration (SIT911 softphone database sync tool)	Netagen	
• Komstat installation + configuration (SIT911 softphone reporting tool)	Netagen	
Komstat installation		
• Install Komstat reporting on KomApp server	Netagen	
• Configure Komstat reporting	Netagen	
• Configure Komstat reporting e-mail account configuration for auto-generation and delivery (if required)	Netagen	
• Test Komstat Reporting	Netagen	
• Komstat Operational Readiness confirmed	Netagen	
SIT2 Testing Activities		
• SIT2 Softphone telephony testing	Netagen	
• SIT2 Softphone plug-in testing	Netagen	
• SIT2 Administrator Console testing	Netagen	
• Customer UAT	Customer	Netagen
• Adjustment after UAT	Netagen	
SIT911 Solution Review Activities		
• Review Design Meeting	Netagen	Customer
• Subsequent Design Meeting	Netagen	Customer
• Review Final Design	Netagen	Customer
SIT911 Komutel Server / Database / Directory		
• Database - Review Changes and Update	Netagen	
• Database - Migration Activities	Netagen	
SIT911 Komutel Workstation / Network		
• Test network connectivity from workstation(s) to database, KomApps Servers and Avaya Aura (ping)	Netagen	

• Headset integration for SIT911 CTI workstations	Netagen	
Configuration		
• SIT911 general configuration #1 – Discovery	Netagen	
• SIT911 general configuration #2 - Review and final decision (if needed)	Netagen	Customer
I3CI Activities		
• I3CI Middleware installed	Netagen	
• I3CI Middleware configured	Netagen	
• I3CI Middleware testing	Netagen	
• I3CI Middleware connectivity to IP VPN	Netagen	
• I3CI Middleware connectivity to CAD	Netagen	
• Call Position ID Mapping	Netagen	
• SIT911 Softphone Call Position ID Data validation	Netagen	
• Reverse ALI configuration	Netagen	
• Reverse ALI testing	Netagen	
• ICLU configuration	Netagen	
• ICLU testing	Netagen	
• I3CI Operational Readiness confirmed	Netagen	Customer
CMS Activities		
• Call Centre - Design Sessions		
o Initial Design Session	Netagen	
o Secondary Design Session - To review Templated Requirements	Netagen	
o Prepare Draft Design document	Netagen	
o Deliver Draft Design document	Netagen	
o Third Design Session - To review to accommodate any additional requirements	Netagen	
o Accommodate Changes to Draft Design document	Netagen	
o Deliver Updated Draft Design document	Netagen	
o Design Sign-Off	Netagen	Customer
• Geomant Activities		
o Install Light Link servers	Netagen	
o Install wallboard server license	Netagen	
o Install wallboard app for screens on customer provided pc and display (LCD screens are a customer responsibility)	Netagen	Customer
o Install WB editor software	Netagen	
o Configure 2 display layouts	Netagen	
o Install agent desktop application	Netagen	

• RT Socket & ODBC Activities		
o Build RT Socket & ODBC Connector	Netagen	
o Integrate with Geomant	Netagen	
o Integration Testing	Netagen	
Systems Integration		
• SIP Endpoint Licenses Configured for SIT911 Softphones	Netagen	
• CC Elite Agent IDs assigned for SIT 911 Softphones	Netagen	
• Star code configurations for 911 transfer provided to Komutel (* code)	Netagen	
• SIP user, password and Agent ID configuration provided to Komutel	Netagen	
• Provide IP address of Session Manager	Netagen	
• Provide directory number (DN) and nbr of appearances configured in the SIP Station of all SIT911 Softphones	Netagen	
SIT911 Softphone Installation		
• SIT911 Softphone installation + configuration	Netagen	
• ANI ALI Plug-in configuration (Need the Mapping table)	Netagen	
• Transfer 911 Plug-in configuration (Star code needed)	Netagen	Customer
• Phone Release Reasons Plug-in configuration	Netagen	
• Call manager Plug-in configuration	Netagen	
• 152 Historical transfer Plug-in configuration	Netagen	
• Document Management Plug-in configuration	Netagen	
• Copy to Call Plug-in configuration	Netagen	
• Help Request / Chat Plug-in configuration	Netagen	
• Web Browser Plug-in configuration	Netagen	
• Audio Player Plug-in configuration	Netagen	
• Dry contact Plug-in configuration	Netagen	
SIT 911 Administrator Console		
• SIT911 Administrator Console installation + configuration	Netagen	
Voice Logger Integration		
• Readiness Assessment of Voice Logging Environment	Netagen	
• Network Testing	Netagen	
• Configuration of AES	Netagen	
Komutel Testing		
• SIT911 Softphone telephony testing	Netagen	

• SIT911 Softphone plug-in testing	Netagen	
• SIT911 Administrator Console testing	Netagen	
• I3CI testing	Netagen	
• Komstat testing	Netagen	
• Komlog testing	Netagen	
Training Activities		
• Training	Netagen	
Testing Activities		
• Conduct Netagen Test Plan	Netagen	
• Conduct Komutel Test Plan	Netagen	
• Conduct Customer UAT Test Plan	Netagen	Customer
Administrator Training		
• Solution overview	Netagen	
• Solution Components dependencies	Netagen	
• Solution Connectivity	Netagen	
• SIT911 Softphone Administrator Console Configuration	Netagen	
• Komlog Training	Netagen	
• Komstat Configuration	Netagen	
• Escalation to Komutel Training Support	Netagen	
Cutover Activities / GO LIVE		
• Final Pre-launch testing	Netagen	Customer
• Confirm roll-back plan	Netagen	Customer
• Confirm post-GO LIVE Support	Netagen	
• CUTOVER / GO LIVE / LAUNCH	Netagen	Customer
• Post-Cut Support	Netagen	
Project Wrap Up Activities		
• Managed Service Invoicing Begins	Netagen	
• Wrap-Up Call	Netagen	Customer
• Deliver Outstanding Items List	Netagen	
• Resolve Any Outstanding Items	Netagen	
Project Closure		
• Project Closure Meeting	Netagen	Customer

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-113

AGREEMENT: A by-law to authorize the execution of the Agreement between the City and NorthernTel Limited Partnership (doing business as Ontera) for the installation and maintenance of the Service Components required to provide Business Internet Services to the legal boundaries of the Customer Sites.

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, **ENACTS** as follows:

1. **EXECUTION OF DOCUMENT**

The Mayor and City Clerk are hereby authorized for and in the name of the Corporation to execute and affix the seal of the Corporation to the Agreement dated May 30, 2022 between the City and NorthernTel Limited Partnership (doing business as Ontera), a copy of which is attached as Schedule “A” hereto. This Agreement is for the installation and maintenance of the Service Components required to provide Business Internet Services to the legal boundaries of the Customer Sites.

2. **SCHEDULE "A"**

Schedule "A" forms part of this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

co \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-113 Ontera.docx

CUSTOMER AGREEMENT – NON-REGULATED / FORBORNE SERVICES

NorthernTel Limited Partnership
(doing business as Ontera*)

Contract ID# 152984 Customer BP# 152984

A. SOLUTION DETAILS

Customer Information

Legal Name ("Customer"): City of Sault Ste. Marie

Contact Name:	Frank Coccimiglio	**Billing Address:**	
Title:	IT Manager	PO Box:	
Phone:	705-759-5303	Suite &/or Street:	99 Foster Drive
Fax:		City, Province:	Sault Ste. Marie ON
Email:	f.coccimiglio@cityssm.on.ca	Postal Code:	P6A 5X6

Service Description and Charges

Service Name or Description	Schedule Attached	Service Address (where service is being deployed)	Contract Term (Months)	One-Time Charges	Monthly Recurring Charges
1. 1 Gig TLS	B,C,G	Civic Center 99 Foster Drive Sault Ste. Marie ON	60		$600.00
2. VLAN service	B,C,G	Civic Center 99 Foster Drive Sault Ste. Marie ON	60		$0.00
3. 500 Mbps TLS	B,C,G	PWT 128 Sackville Road, Sault Ste. Marie ON	60		$550.00
4. VLAN service	B,C,G	PWT 128 Sackville Road, Sault Ste. Marie ON	60		$0.00
5.10 Mbps TLS	B,C,G	John Rhodes, 280 Elizabeth Street Sault Ste. Marie ON	60		$335.00
6.100 Mbps TLS	B,C,G	Main Fire Hall, 72 Tancred Street Sault Ste. Marie ON	60		$450.00
7. 10 Mbps TLS	B,C,G	Senior Center – 619 Bay Street. Sault Ste. Marie ON	60		$335.00
8. 100 Mbps TLS	B,C,G	Transit – 111 Huron Street. Sault Ste. Marie ON	60		$450.00
9. 10 Mbps TLS	B,C,G	Fire Hall #2 363 Second Line West, Sault Ste. Marie ON	60		$335.00
10. 10 Mbps TLS	B,C,G	Heritage Center – 831 Queen Street. Sault Ste. Marie ON	60		$335.00
11. 10 Mbps TLS	B,C,G	Fire Hall #3 100 Bennet Street. Sault Ste. Marie ON	60		$335.00
12. 100 Mbps TLS	B,C,G	GFL Memorial Gardens, 269 Queen Street, Sault Ste. Marie ON	60		$450.00
13. 10 Mbps TLS	B,C,G	Fire Hall – RESC, 65 Old Garden River Road Sault Ste. Marie ON	60		$335.00
14. 10 Mbps TLS	B,C,G	Cemetery, 27 Fourth Line Sault Ste. Marie ON	60		$335.00
15.100 Mbps TLS	B,C,G	SSMIC, 1520 Queen St East Sault Ste. Marie ON	60		$450.00
16. 10 Mbps TLS	B,C,G	Northern Community Center, 556 Goulais Ave Sault Ste. Marie ON	60		$335.00
17. 10 Mbps TLS	B,C,G	Police, 580 Second Line East Sault Ste. Marie ON	60		$335.00
18. 10 Mbps TLS	B,C,G	Northern Branch Library, 232 C Northern Ave E Sault Ste. Marie ON	60		$335.00
19. 10 Mbps TLS	B,C,G	Centennial Library, 50 East Street Sault Ste. Marie ON	60		$335.00
			Totals		

Notes:

* Ontera is a registered business name of NorthernTel Limited Partnership

Authorization

This Agreement is between NorthernTel Limited Partnership ("Ontera") and the Customer and consists of the section titled "SOLUTIONS DETAILS", the sections titled "GENERAL TERMS AND CONDITIONS" and "SERVICE TERMS AND CONDITIONS", and any documents and web pages referred to in any of these sections.

If there is any conflict between these sections, the "SERVICE TERMS AND CONDITIONS" will take precedence. The Customer acknowledges that it has read and understands this Agreement, and that it includes limitations of liability. The Customer and Ontera agree to be bound by the terms and conditions in this Agreement.

The "Authorized Customer Representative" by providing his/her/their signature's below, is confirming his/her/their authority to bind the corporation.

Signature of Authorized Customer Representative		**Ontera Representative/Authorized Dealer**	
		Name: Chantal Bizier	
		Title: Inside Sales Specialist	
	Date	Phone: 888-566-8372	Fax:
		Email: Chantal.bizier@ontera.ca	
Printed Name	Title	ID: Chantal Bizier	
		Signature of Authorized Ontera Representative	
			Date:
		Printed Name	Title

B. GENERAL TERMS AND CONDITIONS

1. Services

Ontera agrees to provide the Customer with the services specified in the Solution Details ("Services").

2. Term

This Agreement comes into effect when signed by both the Customer and Ontera. The Minimum Term for each Service is specified in the Solution Details and begins on the date all of those Services have been installed by Ontera as confirmed by e-mail from the Ontera* Representative/Authorized Dealer and/or by Ontera's Project Manager. Unless otherwise specified in the Service Terms and Conditions, this Agreement, as it applies to each Service will automatically extend after the Minimum Term from month to month, on the same terms and conditions, except that after the Minimum Term for that Service either Ontera or the Customer may terminate this Agreement as it applies to that Service, and Ontera may change the charges or any other terms and conditions of this Agreement applicable to that Service, by giving 30 days advance notice to the other. This Agreement as it applies to each Service, remains in effect until the end of the Minimum Term, unless terminated earlier or extended.

3. Charges and Payment

Ontera will bill the Customer for, and the Customer shall pay, all charges specified in the Solution Details or elsewhere in this Agreement and all applicable taxes, assessments or government charges relating to the Services. Recurring charges will be billed monthly upon installation of any Services. Payment in full, without deduction or set off, of the amounts in each bill is due on the due date shown on the bill or, if no due date is shown on the bill, within 30 days of the date of the bill. The Customer shall pay interest on all overdue amounts at the rate shown on Ontera's billing statements from time to time.

4. Dispute Resolution

The Parties shall attempt amicably to adjust and resolve any disagreement or dispute which may arise between them regarding the interpretation, the performance of or the failure to perform under this Agreement. In the event that any dispute, controversy, claim or alleged breach respecting this Agreement (each a "Dispute") continues for a period greater than thirty (30) days, the Dispute shall be referred to the Account Manager and his or her counterpart at the Customer. Should the Dispute not be resolved within 15 days of its referral, the Dispute will be escalated to the office of the vice-presidents of sales of Ontera and his or her counterpart at the Customer. Should the Dispute not be resolved by the vice-presidents within 30 days of its escalation, the Dispute shall be submitted to arbitration. The arbitration shall be held in Toronto, Ontario and shall be conducted in accordance with the Arbitration Act of Ontario except that the arbitration shall be conducted by either (a) an arbitrator selected by agreement of both parties or (b) if the parties are unable to agree on the choice of an arbitrator, by an arbitrator appointed by a Justice of the Ontario Court (General Division). The decision of the arbitrator shall be final and binding upon the parties and the expense of the arbitration shall be paid as the arbitrator determines.

5. Ontera Property Rights

Title to, ownership of, and all intellectual property rights in any facilities, equipment, software, systems, processes and documentation used to provide the Services ("Service Components") shall be and remain with Ontera or its suppliers and licensors. Unless expressly stated elsewhere in this Agreement, this Agreement does not grant to the Customer any intellectual property or other rights or licenses in or to any Service Components.

6. Customer's Responsibilities

The Customer shall comply with any restrictions on use of the Services in this Agreement, and with any use policies or instructions communicated to the Customer by Ontera and the Customer shall not:

a) tamper with or change the Services or any Service Components;
b) abuse the Services or use them in a manner that interferes with any Service Components, Ontera's network or the use of Ontera services by other persons, or in a manner that avoids the payment of any charges; or
c) use the Services in violation of any law.

The Customer is responsible and shall indemnify Ontera and its suppliers for, and save Ontera and its suppliers harmless from and against, all charges, losses, costs, liabilities and damages ("Liabilities") of any kind whatsoever related to the use of the Services by the Customer or any person other than Ontera, including the manner in which the Services are used and the Customer's data, equipment and software (if any) used with the Services, but not including any Liabilities caused by Ontera's negligence.

The Customer is responsible for the selection, supply, installation and maintenance of all data, equipment, software and services necessary for use or used in conjunction with the Services.

7. Exclusion of Warranties

Ontera does not guarantee error-free or uninterrupted operation of the Services, and the Services are provided on an "as is" and "as available" basis. Ontera makes no warranties, representations, or conditions of any nature whatsoever either express or implied, and all warranties, representations and conditions are, to the extent permitted by applicable law, excluded.

8. Limitation of Liability

Except for the obligations of indemnity in this Agreement, neither party (nor its suppliers or customers) shall be liable to the other party for any damages for loss of profits or business, loss or damage to data or failure to realize expected savings, or for any punitive, consequential, incidental or indirect damages, related to the use of or inability to use the Services, even if the party could reasonably foresee or has been advised of the possibility of such damages.

The aggregate liability of Ontera to the Customer relating to or arising out of this Agreement, whether in contract, tort or otherwise, shall not exceed the total charges paid by the Customer for the Services in question during the one-year period immediately preceding the event which gave rise to the claims.

9. Suspension and Termination

Ontera may restrict, suspend or terminate some or all of the Services or terminate this Agreement if the Customer fails to pay any amounts due under this Agreement, or if Ontera determines, in its sole discretion, that the Customer is an unacceptable credit risk, provided that Ontera gives 5 days advance notice to the Customer, and, despite any other provision in this Agreement, Ontera may immediately restrict, suspend or terminate some or all of the Services without notice to the Customer:

a) to prevent damage or degradation to Ontera's network or any Service Components that may be caused by the Customer or any person using the Services;
b) to comply with any law, regulation, court order or other governmental request or order;
c) for a violation (as deemed by Ontera in its sole discretion) of any provisions of this Agreement relating to the use or misuse of the Services by the Customer, including any policies or instructions communicated to the Customer by Ontera; or
d) to protect Ontera from legal liability or from other acts or omissions of the Customer that may be deemed, in Ontera's sole discretion, to be illegal.

In addition to Ontera's rights above, either Ontera or the Customer may terminate this Agreement and the Services by giving notice to the other if the other:

a) is in material default of any provision of this Agreement, and does not remedy that default within 30 days after receiving notice of the material default;
b) becomes insolvent or bankrupt;
c) appoints, or has appointed for it, a receiver or trustee in bankruptcy;
d) makes an assignment or takes any other action for the benefit of its creditors; has instituted against it any proceeding in bankruptcy, receivership or liquidation, and such proceedings continue for 30 days without being dismissed; or
e) is wound up or dissolved.

The Customer may terminate some or all of the Services, or this Agreement, at any time by giving at least 30 days advance notice to Ontera, and provided that it pays the required termination charges.

…continued

B. GENERAL TERMS AND CONDITIONS (continued)

9. Suspension and Termination (continued)

If any Services, or this Agreement, are terminated prior to the end of the Minimum Term by either the Customer or Ontera, for any reason, the Customer shall pay Ontera all unpaid charges and, except for termination because of the material default of Ontera, the Customer shall also pay the termination charges specified in the Service Terms and Conditions, as liquidated damages. The Customer acknowledges that the termination charges are a pre-estimate of the damages suffered by Ontera as a result of the early termination of the Services, or this Agreement and are not a penalty.

10. Regulatory Compliance

No Bundling. Ontera and the Customer acknowledge and agree that: (a) the charges for, and availability of, the Services are in no way contingent or conditional on the Customer subscribing for the provision of any tariffed or tariffable service from Ontera or an Ontera Affiliate; and (b) non-forborne telecommunications services, and bundled services that include non-forborne telecommunications services, are required to be provided, and shall only be provided, in accordance with the tariffs approved by the Canadian Radio-television and Telecommunications Commission.

Tariffs Applicable to the Services include the following: None. The Services are either non-regulated or forborne.

Customer Information. In relation to all telecommunications services provided by NorthernTel Limited Partnership ("Ontera"), unless the Customer provides express consent or disclosure is pursuant to a legal power, all information kept by Ontera regarding the Customer, other than the Customer's name, address and listed telephone number, is confidential and may not be disclosed by Ontera to anyone other than: the Customer; a person who, in the reasonable judgment of Ontera is seeking the information as an agent of the Customer; another telephone company, provided the information is required for the efficient and cost-effective provision of telephone service and disclosure is made on a confidential basis with the information to be used only for that purpose; a company involved in supplying the Customer with telephone or telephone directory related services, provided the information is required for that purpose and disclosure is made on a confidential basis with the information to be used only for that purpose; an agent retained by Ontera to evaluate the Customer's creditworthiness or collect the Customer's account, provided the information is required for and is to be used only for that purpose; or to a public authority or agent of a public authority, if in the reasonable judgment of Ontera it appears that there is imminent danger to life or property which could be avoided or minimized by disclosure of the information. Express consent may be taken to be given by the Customer where the Customer provides written consent, oral confirmation verified by an independent third party, electronic confirmation through the use of a toll-free number, or electronic confirmation via the Internet.

Consent. The Customer consents to the disclosure of and sharing by Ontera and their agents of information that they have about the Customer in order to assess the Customer's creditworthiness and to market or provide products and services of Ontera and third parties who provide products and services in association with Ontera.

11. Facsimile or PDF Signatures

Transmission – This agreement and any agreements, notices or other communications contemplated thereby may be transmitted by means of facsimile or scanned PDF document in which case signatures shall be deemed to be original. The transmission of this Agreement by either party by means of facsimile or scanned PDF document shall be deemed to confirm that the party has retained a true copy of the Agreement. The parties undertake to provide the other party with a copy of this Agreement bearing original signatures forthwith upon demand.

Counterpart – This agreement may be executed by the parties in separate counterparts, each of which shall be deemed to constitute an original, but all of which together shall constitute one and the same agreement. This Agreement will be considered fully executed when all parties have executed an identical counterpart, notwithstanding that all signatures may not appear on the same counterpart.

12. Other

Interpretation. The headings in this Agreement shall not affect the interpretation of any provision of this Agreement. The words "including" and "includes" mean "including without limitation" and "includes without limitation". An "Affiliate" means an affiliated body corporate as defined in the Canada Business Corporations Act and, in the case of an Ontera Affiliate, means an affiliated body corporate (as so defined) of Ontera and any partnership or other unincorporated association in which Ontera or any of its affiliated bodies corporate has a controlling interest.

Ontera. "Ontera" means each Ontera Affiliate that provides a Service. As it relates to each Service, this Agreement is deemed to be solely between the Customer and the Ontera Affiliate specified as the Service provider in the Service Terms and Conditions, with the Ontera representative having signed this Agreement on behalf of each such Ontera Affiliate.

Assignment. The Customer shall not assign all or any part of this Agreement without the prior written consent of Ontera. Ontera may withhold its consent to a proposed assignment by the Customer to a person who is in the business of providing telecommunications or telecommunications-related products or services. Ontera may assign or subcontract all or any part of its rights and obligations under this Agreement or the Services without notice to or consent of the Customer.

Relationship. This Agreement does not create or imply any agency, partnership or other joint relationship between the parties, and does not authorize either party to bind or obligate the other in any way.

Force Majeure. Ontera is not responsible for performance of, or in default of, any obligation or provision of this Agreement where delayed, hindered or prevented by labour disruptions, failure of the networks of other companies, casualties, civil disturbances, legislation, regulation, judicial order, acts of civil or military authorities, accidents, fires, natural disasters or other catastrophes or events beyond Ontera's reasonable control.

Severability. If any part of this Agreement is void, prohibited or unenforceable, this Agreement shall be construed as if such part had never been part of this Agreement.

No Waiver. The failure of the Customer or Ontera to exercise any right under this Agreement, or to insist upon strict or full performance of the obligations under this Agreement, shall not constitute a waiver or relinquishment of any provision of this Agreement. In order to be binding upon a party, any such waiver must be express and in writing signed by that party. The rights of the parties under this Agreement are cumulative and not alternative.

Survival. Any provisions of this Agreement which, expressly or by their nature, extend beyond the termination of this Agreement, shall survive any termination of this Agreement.

Law. Ontera and the Customer shall comply with all laws applicable to the exercise of their rights and performance of their obligations under this Agreement. The laws in effect in Ontario shall apply to this contract. The parties agree that jurisdiction and venue in the courts of Ontario is appropriate and the Customer agrees that it will bring legal proceedings only in Ontario.

Notices. All notices necessary under this Agreement shall be given in writing, and either personally delivered, or sent by registered mail or facsimile to the Customer at its billing address in the Solution Details and to Ontera at 555 Oak Street East, North Bay, Ontario, P1B 8L3. Fax: 1-705-472-6765. Notices, if personally delivered or sent by facsimile, will be deemed to have been received the same day, or, if sent by registered mail, will be deemed to have been received 4 days (excluding Saturdays, Sundays and statutory holidays) after the date of mailing.

Entire Agreement. Any terms and conditions in a purchase order or other similar document issued by the Customer in relation to any Services that are different from or in addition to those in this Agreement are not binding on and are rejected by Ontera. This Agreement forms the entire Agreement between the parties, and supersedes all prior written and oral communications and Agreements between the parties, concerning the Services. All changes to this Agreement must be agreed to in writing and signed by both parties. This agreement has been drawn up in English at the request of the parties. Les parties ont convenu que la présente entente soit rédigée en anglais.

C. SERVICE TERMS AND CONDITIONS: BUSINESS INTERNET SERVICES

1. Business Internet Services

The Service Terms and Conditions in this sub-section apply to all Business Internet Services specified in the Solution Details. The "Customer Site" is at the Service Address specified in the Solution Details.

1.1 Customer Responsibilities

Ontera[2] (or its authorized subcontractor) will install and maintain the Service Components required to provide Business Internet Services to the legal boundary of the Customer Site. The Customer shall be responsible for obtaining at its sole cost all rights-of-way, permissions and/or third party consents required to permit Ontera to install and maintain the Service Components from the legal boundary of each Customer Site to the Service Demarcation (defined below), including the consent of the Customer's landlord or building owner. The Customer shall be responsible for satisfying all requirements imposed by a building's design or by building management as it applies to Business Internet Services installation or the Service Components, including the payment of any additional fees, conduit installation, design submissions, and installation approvals.

The Customer shall, at its cost, prepare the Customer Site for the installation of the Business Internet Services, including any Service Components, in accordance with Ontera's reasonable instructions. The Customer is responsible for any additional installation costs incurred by Ontera as a result of the Customer's failure to comply with such instructions. Changes in the environment or location of any Service Components at the Customer Site will require the prior written consent of Ontera.

The Customer grants Ontera and its authorized subcontractors access to the Customer Site to install and maintain the Business Internet Services and the Service Components. Ontera shall not be responsible for any delays, interruptions in the Business Internet Services, damages or costs that may result if Ontera is unable to obtain access to the Customer Site. The Customer is responsible for the care and protection of any Service Components installed on the Customer Site, and is liable to Ontera for all loss or damage, other than ordinary wear and tear, to such Service Components.

1.2 Termination Charge

The termination charge payable by the Customer for termination of any Business Internet Services prior to the end of the Minimum Term is calculated as follows:

a) all of the total fixed monthly charges that would have been payable after the date of termination until the end of the Minimum Term (the "Total Remaining Charges") if the Internetworking Service is terminated prior to the installation of the last Customer Site on the Solution Details for which the Internetworking Service was to be installed; or
b) all Total Remaining Charges if the Internetworking Service is terminated during the first 12 months; or
c) 75% percent of the Total Remaining Charges if the Internetworking Service is terminated between the 13th to 24th month; or
d) 50% percent of the Total Remaining Charges if the Internetworking Service is terminated between the 25th to 36th month; or
e) 25% percent of the Total Remaining Charges if the Internetworking Service is terminated on or after the 37th month.

The Customer may adopt new technologies, pricing and services offered by Ontera during the Minimum Term, and if doing so results in the termination of any Business Internet Services, the termination charge shall be waived, if: (a) the Customer adopts the new technologies, pricing or services for a period of time that is equal to or longer than the remainder of the Minimum Term; and, (b) the fixed monthly charges for the new technologies, pricing or services are equal to or greater than those payable for the terminated Business Internet Services.

1.3 Relocation

Business Internet Services may be moved from the Customer Site to another location. To relocate the Network Services, the Customer must provide Ontera with 60 days notice in writing and pay the applicable installation charges. The contract Service Details will be updated with the new Customer Site information.

1.4 Changes

The Customer may make additions or changes to the Business Internet Services through an Amendment Schedule section prepared by Ontera. Each Amendment Schedule must be signed by Ontera and the Customer before it is effective and when effective, will form part of this Agreement.

The Minimum Term and charges that will apply to any additional Business Internet Services will be specified in the Amendment Schedule, and will begin on the date the additional Business Internet Services have been installed by Ontera.

1.5 Restrictions and Service Limitation

The Customer shall comply with Ontera's acceptable use policy, published at **http://www.ontera.ca/en/legal_aup.html** ("AUP") and Ontera's IP addressing practices. Ontera may change the AUP at any time, in its sole discretion, and publishing the changed AUP at **http://www.ontera.ca** will be sufficient notice of the changes to the Customer. Ontera may change its IP addressing practices from time to time, in its sole discretion, without notice to the Customer.

Unless expressly permitted by Ontera, the Customer shall not resell the Business Internet Services, or access to the Business Internet Services, directly or indirectly to third parties. If Ontera permits such resale to or access by third parties the Customer shall be responsible for all such third party use or access and shall indemnify Ontera against all damages, costs and legal fees incurred by Ontera from any claim arising from third party use of or access to the Business Internet Services.

Ontera does not provide any guarantees for security of the Customer's network connected to the Internet. Customers are responsible to implement their own security policies, which may include Ontera firewall implementation.

….continued

[2] Ontera is a registered trademark of NorthernTel Limited Partnership Inc.

C. SERVICE TERMS AND CONDITIONS: BUSINESS INTERNET SERVICES (continued)

1.6 Maintenance and Service Availability

Ontera shall be responsible for the installation and maintenance of the Network Services up to and including the Service Demarcation.

Ontera may perform maintenance at predetermined times scheduled by Ontera, or at other times advised by Ontera (such advice may be given orally and without any written notice). Ontera may set or change its maintenance schedule at any time without notice to the Customer.

An out-of-service condition commences when identified by either Ontera or by the Customer and ends when all faults are rectified and the Service is returned to the Customer in normal working condition.

2. Additional Service Terms and Conditions: Ontera Business High Speed Internet Access (HSIA) Services

The Service Terms and Conditions in this subsection apply only to Business High Speed Internet Access Service ("HSIA Service") specified in the Solution Details. Each HSIA Service is an Internetworking Service provided by Ontera.

2.1 Service Description and Demarcation

HSIA Services are unmanaged network services used for Personal Computer ("PC") and LAN interconnection to the Internet using the Internet Protocol ("IP").

In the case of ADSL-based services, HSIA Services require a working business telephone line from the Customer's local telephone company at the Customer Site. The line shall be terminated on an Ontera-provided Customer Interface Package* ("CIP") located in the master telephone room at the Customer Site. The CIP will be equipped with a LAN interface port (the "Service Demarcation") which is to be used by the Customer to connect the Customer's network to the CIP. Optionally, the CIP may be located elsewhere within the building using Customer-provided in-building Service Components (e.g. inside wiring).

Some ADSL-based HSIA Services may be delivered on a dedicated copper loop instead of a working business telephone line. The loop will be terminated on an Ontera-provided CIP located in the master telephone room at the Customer Site. The CIP will be equipped with a Service Demarcation which is to be used by the Customer to connect the Customer's network to the CIP. Optionally, the CIP may be located elsewhere within the building using Customer-provided in-building Service Components.

In the case of Cable-based services, HSIA Services require a Cable access from the Cable Television company ("Cableco") at the Customer Site. The line will be terminated on an Ontera-provided CIP, supplied by the Cableco, and located in the master telephone room at the Customer Site. The CIP will be equipped with a Service Demarcation which is to be used by the Customer to connect the Customer's network to the CIP. Optionally, the CIP may be located elsewhere within the building using Customer-provided in-building Service Components.

* The CIP may consist of one or more Ontera-supplied devices (e.g. Modem, Router and/or Firewall)--depending on the HSIA Services specified in the Solution Details.

2.2 Charges

In addition to the fixed monthly charges, variable Internet usage charges may apply. All usage charges will be billed monthly and are based on the total gigabytes of traffic sent and received per individual Customer access as described in the following table.

Usage Option 1	DSL Is flat rate usage. No separate usage charges apply.

2.3 Availability and Degradation

For ADSL-based Services, Ontera will furnish a CIP and associated data over voice service for each of the HSIA Services. If Ontera determines during installation at the Customer Site that the telephone line loop is unsuitable for any HSIA Services, those HSIA Services will be terminated, the termination charge waived and any installation fees returned to the Customer. If the Customer experiences service degradation subsequent to installation, even where the telephone line has been qualified, Ontera will investigate the cause of the degradation and will attempt to provide a suitable workaround. If a suitable workaround cannot be found or reasonably implemented then the Customer may terminate the affected HSIA Services without incurring the termination charge.

For Cable-based Services, Ontera will furnish a CIP and associated data over Cable service for each of the HSIA Services. If Ontera determines during installation at the Customer Site that Cable access is unsuitable for any HSIA Services, those HSIA Services will be terminated, the termination charge waived and any installation fees returned to the Customer. If the Customer experiences service degradation subsequent to installation, even where the Cable access has been qualified, Ontera will investigate the cause of the degradation and will attempt to provide a suitable workaround. If a suitable workaround cannot be found or reasonably implemented then the Customer may terminate the affected HSIA Services without incurring the termination charge.

2.4 Customer Responsibilities

HSIA Services will be provisioned in accordance with IP addressing and routing standards, and the Customer must ensure non-conflicting LAN address practices are maintained within the network plan. If Ontera provides the IP addresses to the Customer these addresses shall be governed by the Ontera IP addressing practices. If the Customer provides the IP addresses, the Customer must assign one IP address for use as the IP address of the CIP, and must also set that IP address as the default gateway for every device at that Site. The Customer is responsible for any equipment or facilities required to complete the connection between the Service Demarcation and the Customer's LAN, and to adapt or connect HSIA Service to the Customer's LAN media, or to extend the Service Demarcation beyond the master telephone room.

G. SERVICE TERMS AND CONDITIONS: ETHERNET SERVICES

1. Ethernet Services

The Service Terms and Conditions in this sub-section apply to all Ethernet Services specified in the Solution Details. The "Customer Site" is at the Service Address(es) specified in the Solution Details.

1.1 Service Description

Ethernet Services are a managed layer 2 data networking service for the interconnection of Local, Metropolitan and Wide Area Networks ("LAN", "MAN" and "WAN", respectively) across Ontera's core network using Ethernet Virtual Circuits ("EVC").

Ontera's Ethernet Services are broken down into two components: Ethernet Access ("EA") and Ethernet Networking ("EN")..

EA Services are provisioned using a fibre, copper or wireless service facility from an Ontera point of presence ("POP") to a Customer Site, terminating on an Ontera-provided demarcation device.

EN Services provide the network path between two Ontera POP's. Subject to technical availability and additional charges identified in Service Orders, the Customer may select one or more of the following EN options for each Ethernet Service: "Standard" is a best effort service; "Priority Data" - a higher-priority service with better frame delivery performance than Standard; "Near Real Time – Video" - an even higher priority service designed for packet video traffic requiring minimal levels of frame delay and "Near Real Time – Voice" - the highest priority service designed for packet voice traffic requiring minimal levels of frame delay, jitter and highest levels of frame delivery.

1.2 Service Demarcation

Unless otherwise specified in the applicable Service Order the "Service Demarcation" for an Ethernet Service shall be at the customer-facing interface of Ontera-supplied demarcation device ("Demarcation Device") located within the master telephone room at the applicable Customer Site. Ontera shall, at its sole cost and expense, be responsible for installing and maintaining the Service Components required to provide Services to the Service Demarcation. The Demarcation Device and Service Demarcation may be provisioned in a location other than the master telephone room at an applicable Customer Site, provided that the Customer either: (a) supplies all inside cabling and cross-connection equipment required to facilitate the relocation of the Demarcation Device and Service Demarcation in a location other than the master telephone room; or (b) (i) notifies Ontera, in advance, that it wishes to contract Ontera to supply all inside cabling and cross-connection equipment required to facilitate the relocation of the Demarcation Device and Service Demarcation in a location other than the master telephone room, and (ii) the Customer agrees to pay Ontera all charges as quoted by Ontera for such work ("Inside Wiring Costs"). Notwithstanding the foregoing, the Customer is responsible for securing all rights-of-way and/or providing conduit access from the Ontera access point at the property line of each Customer Site to the master telephone room located within the Customer Site. In-building service facilities required to install the Service at the Customer Site are to be provided by the Customer.

1.3 Customer Responsibilities

Ontera (or its authorized subcontractor) will install and maintain fibre patch panels, in-building cabling, wireless distribution equipment, switches, routers or other equipment required (the "Service Components") to provide Ethernet Services to the legal boundary of the Customer Site. The Customer shall be responsible for obtaining at its sole cost all rights-of-way, permissions and/or third party consents required to permit Ontera to install and maintain the Service Components from the legal boundary of each Customer Site to the Service Demarcation (defined below), including the consent of the Customer's landlord or building owner. The Customer shall be responsible for satisfying all requirements imposed by a building's design or by building management as it applies to Ethernet Services installation or the Service Components, including the payment of any additional fees, conduit installation, design submissions, and installation approvals.

The Customer shall, at its cost, prepare the Customer Site for the installation of the Ethernet Services, including any Service Components, in accordance with Ontera's reasonable instructions. The Customer is responsible for any additional installation costs incurred by Ontera as a result of the Customer's failure to comply with such instructions. Changes in the environment or location of any Service Components at the Customer Site will require the prior written consent of Ontera. The Customer is responsible for any costs incurred by Ontera or its third party suppliers as the result of such changes or delays in preparation of the Customer Site for any reason.

The Customer grants Ontera and its authorized subcontractors access to the Customer Site to install and maintain the Ethernet Services and the Service Components. Ontera shall not be responsible for any delays, interruptions in the Ethernet Services, damages or costs that may result if Ontera is unable to obtain access to the Customer Site. The Customer is responsible for the care and protection of any Service Components installed on the Customer Site, and is liable to Ontera for all loss or damage, other than ordinary wear and tear, to such Service Components.

1.4 Termination Charge

The termination charge payable by the Customer for termination of any Ethernet Services prior to the end of the Minimum Term is calculated as follows:

f) all of the total fixed monthly charges that would have been payable after the date of termination until the end of the Minimum Term (the "Total Remaining Charges") if the Ethernet Service is terminated prior to the installation of the last Customer Site on the Solution Details for which the Ethernet Service was to be installed; or

g) all Total Remaining Charges if the Ethernet Service is terminated during the first 12 months; or

h) 75% percent of the Total Remaining Charges if the Ethernet Service is terminated between the 13th to 24th month for contracts 24 months or longer in duration; or

i) 50% percent of the Total Remaining Charges if the Ethernet Service is terminated between the 25th to 36th month for contracts 36 months or longer in duration; or

j) 25% percent of the Total Remaining Charges if the Ethernet Service is terminated on or after the 37th month for contracts 48 months or longer in duration.

The Customer may adopt new technologies, pricing and services offered by Ontera during the Minimum Term, and if doing so results in the termination of any Ethernet Services, the termination charge shall be waived, if: (a) the Customer adopts the new technologies, pricing or services for a period of time that is equal to or longer than the remainder of the Minimum Term; and, (b) the fixed monthly charges for the new technologies, pricing or services are equal to or greater than those payable for the terminated Ethernet Services.

1.5 Relocation

The Ethernet Services may be moved from the Customer Site to another location. To relocate the Ethernet Services, the Customer must provide Ontera with 60 days notice in writing and pay the applicable installation charges. The contract Service Details will be updated with the new Customer Site information.

1.6 Changes

The Customer may make additions or changes to the Ethernet Services through an additional Solution Details (Schedule A) section prepared by Ontera. Each additional Solution Details section must be signed by Ontera and the Customer before it is effective and when effective, will form part of this Agreement.

The Minimum Term and charges that will apply to any additional Ethernet Services will be specified in the additional Solution Details section (Schedule A), and will begin on the date the additional Ethernet Services have been installed by Ontera.

…continued

G. SERVICE TERMS AND CONDITIONS: ETHERNET SERVICES (continued)

1.7 Restrictions and Service Limitation

The Customer shall comply with Ontera's Acceptable Use Policy, published at **http://www.ontera.ca/index.php/en/about-ontera/legal/acceptable-use-policy** ("AUP") and Ontera's IP addressing practices. Ontera may change the AUP at any time, in its sole discretion, and publishing the changed AUP at **www.ontera.ca** will be sufficient notice of the changes to the Customer. Ontera may change its IP addressing practices from time to time, in its sole discretion, without notice to the Customer.

Unless expressly permitted by Ontera, the Customer shall not resell the Ethernet Services, or access to the Ethernet Services, directly or indirectly to third parties. If Ontera permits such resale to or access by third parties, the Customer shall be responsible for all such third party use or access and shall indemnify Ontera against all damages, costs and legal fees incurred by Ontera from any claim arising from third party use of or access to the Ethernet Services.

Ontera does not provide any guarantees for security of the Customer's network connected to the Internet. Customers are responsible to implement their own security policies, which may include an Ontera firewall implementation.

2. Maintenance and Service Availability

Ontera shall be responsible for the installation and maintenance of the Ethernet Services up to and including the Service Demarcation.

Refer to Schedule H: Maintenance and Service Level Objectives – Ethernet Services for a detailed description of Maintenance and Service Availability.

2.1 Service Specifics

The following section contains more specific information related to the Solutions Details (Schedule A) and is included as necessary for clarification purposes only.

(Insert solution details as required or NOT APPLICABLE if further details are not needed)

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-114

PARKING: A by-law to appoint Municipal Law Enforcement Officers to enforce the by-laws on various private properties and to amend Schedule "A" to By-law 90-305.

THE COUNCIL of the Corporation of the City of Sault Ste. Marie pursuant to Section 15 of the *Police Services Act,* R.S.O. 1990, chapter P.15 and amendments thereto, **ENACTS** as follows**:**

1. **SCHEDULE "A" TO BY-LAW 90-305 AMENDED**

   Schedule "A" to By-law 90-305 is hereby repealed and replaced with Schedule "A" attached to this by-law.

2. **EFFECTIVE DATE**

   This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

da legal\Staff\COUNCIL\BY-LAWS\2022\2022-114 Amend By-law 90-305 Municipal Law Enforcement Officers.docx

BADGE	SPECIAL CONSTABLE SCHEDULE "A"	EMPLOYER	PROPERTY LOCATION
26	MCLEOD,ROD	FLEMING & SMITH	378 QUEEN ST E & APARTMENTS & 27 KING ST
30	RENDELL,VERN	ALGOMA CENTRAL PROP	STATION MALL/STATION 49/STATION TOWER
151	PARR,DEREK	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
163	BUMBACCO,PHILIP	ALGOMA CENTRAL PROP	STATION MALL/STATION 49/STATION TOWER
196	MCGRAYNE,LAURA LEE	ALGOMA CENTRAL PROP	STATION MALL/STATION 49/STATION TOWER
253	TRAVESON,TERRANCE	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
267	CORBIERE,JOHN(TED)	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
276	SMITH,DENNIS,ROBERT	G4S SECURE SOLUTIONS	SAULT AREA HOSPITAL
334	MILLER,BRADLEY	CITY OF SAULT STE MARIE	TRANSIT SERVICE AREA
344	HARPE,KEN	HOLIDAY INN	320 BAY ST
366	TROINOW,VICTORIA	G4S SECURE SOLUTIONS	SAULT HOSPITAL
370	HANSEN,LOUIS	ONT FINNISH HOME ASS	725 NORTH ST
372	BENOIT,ALAIN	ONT FINNISH HOME ASS	725 NORTH ST
374	TAAVEL,ANDRE	CITY OF SAULT STE MARIE	TRANSIT SERVICE AREA
397	LAFRAMBOISE,YVON	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
411	MOORE,ROBERT	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
443	MARCIL,MARK	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
446	HALLIDAY,DANA	SAULT COLLEGE	443 NORTHERN AVE
456	CONEYBEARE,KEVIN	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
459	SLEEMAN,RAY	G4S SECURE SOLUTIONS	SAULT AREA HOSPITAL
460	BOUGIE,DAN	G4S SECURE SOLUTIONS	SAULT AREA HOSPITAL
463	MORIN,ALEX	CORPS OF COMM	GREAT LAKES FOREST RESEARCH CENTRE
464	DITOMMASO,RYAN	2220917 ONT INC	489 BAY ST/535 QUEEN ST E
465	DELAVALLE,DON	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
484	MCLEOD, VIRGINIA	CITY OF SAULT STE MARIE	PARK&SPORTS COMPLEX/QE SPORTS COMPLEX/JOHN RHODES COMMUNITY
493	BROWN,FRASER	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
516	GAY,JAMES	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
517	ROY,BRENDA	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
541	DIMMA,WILLIAM	ALGOMA CENTRAL PROP	STATION MALL/STATION 49/STATION TOWER
547	LIEPA,MATTHEW	ALGOMA CENTRAL PROP	STATION MALL/STATION 49/STATION TOWER
548	CARON,ROGER	CITY OF SAULT STE MARIE	99 FOSTER DR (CIVC CENTRE)
565	LISCUMB,GERALD	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
566	SWEET,WILLARD	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
568	PICK,DENNY	CORPS OF COMM	SAULT AIRPORT
574	BOUCHARD,DARYL	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
599	BUMBACCO,CARL	CB HOME INSTALLTIONS	321 JOHN ST /342,346 ST GEORGE'S AVE
601	HART,JASON	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
602	GREENWOOD,LESLIE	GREENWOOD HARDWARD	41 ALBERT ST W
603	LAMMING,DAVE	CITY OF SAULT STE MARIE	TRANSIT SERVICE AREA
607	FROST,CHRISTIAN	CITY OF SAULT STE MARIE	TRANSIT SERVICE AREA
608	ALISAT,THOMAS	ALISATS RUST PROOFING	24 QUEEN ST W
609	ROBINSON,SHAWN	ALISATS RUST PROOFING	24 QUEEN ST W
611	MIZZI,PRESTON	WENDY'S	1 QUEEN ST W
619	BERTO,DEBORAH	GATEVIEW REALTY INC	304-310 ALBERT ST/420A&B MCNABB/715 DOUGLAS/67 ELGIN/47 PRINCESS/18 FERGUSON
622	PROULX,PATRICK	CITY OF SAULT STE MARIE	JOHN RHODES/ESSAR CENTREMCMEKKEN CENTRE/NORTHERN COMMUNITY CENTRE
623	AYTON,BENJAMIN	CITY OF SAULT STE MARIE	JOHN RHODES/GFL MEMORIAL GARDENS/MCMEEKEN CENTRE/NORTHERN COMMUNITY CENTRE
624	MIHAILIUK,JASON	CITY OF SAULT STE MARIE	JOHN RHODES/GFL MEMORIAL GARDENS/MCMEEKEN CENTRE/NORTHERN COMMUNITY CENTRE
627	BAKER,WILLIAM	STANDARD PARKING	ONTARIO REALITY CORP/ROBERTA BONDAR PLACE/426 QUEEN ST E/BREWERY BLOCK
633	HILL,MICHAEL	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
634	TIBBLES,COLLEEN	STANDARD PARKING	ONTARIO REALITY CORP/ROBERTA BONDAR PLACE/426 QUEEN ST E/BREWERY BLOCK
637	TOMASONE,LUIGI	LOU'S AUTOMOTIVE	317 ALBERT ST E
638	SICOLY,TERESA	AIRPORT	1-475 AIRPORT RD
643	SHAW,KEVIN	CITY OF SAULT STE MARIE	BELLUVUE MARINA &PARK/ BONDAR MARINE & PARK/STRATHCLAIR DOG PARK&SPORTS COMPLEX/QE SPORTS COMPLEX
644	SANTA MARIE,ROBERT	CITY OF SAULT STE MARIE	JOHN RHODES/ESSAR CENTREMCMEKKEN CENTRE/NORTHERN COMMUNITY CENTRE
646	BOOTH,ABBY	CITY OF SAULT STE MARIE	JOHN RHODES/ESSAR CENTREMCMEKKEN CENTRE/NORTHERN COMMUNITY CENTRE
649	GRAHAM,STEVEN	FENGATE PROPERTY	248 NORTHERN AVE
653	BIOCCHI,CHRISTOPHER	AIRPORT	1-475 AIRPORT RD
664	HAMMERSTEDT,ERIC	STRICTLY CONFIDENTIAL INC	RJ'S MARKET
665	MATTHEWS,SUANNE	NORTHLAND ANIMAL HOSP	695 TRUNK RD
666	AITKEN,ANDREW	G4S SECURITY	SAULT HOSPITAL
669	BOREAN,RICK	CITY OF SAULT STE MARIE	BELLUVUE MARINA &PARK/ BONDAR MARINE & PARK/STRATHCLAIR DOG PARK&SPORTS COMPLEX/QE SPORTS COMPLEX
670	MCGUIRE,STEVE	REGENT PROPERTY	402/302 BAY ST/390 BAY/RIVERWALK CONDOS
671	MCGUIRE,PATRICK	REGENT PROPERTY	402/302 BAY ST/390 BAY/RIVERWALK CONDOS
674	DERASP,RICHARD	CORPS OF COMM	SAULT AIRPORT
676	THOMPSON,JOHN	CORPS OF COMM	SAULT AIRPORT
677	MACMILLAN,TYLER	CORPS OF COMM	SAULT AIRPORT
678	PERRON,JENNIFER	CORPS OF COMM	SAULT AIRPORT
679	CHATEAUNEUF,YVON	CORPS OF COMM	SAULT AIRPORT
686	ASH,KEITH	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
687	POSSAMAI,MIKE	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
688	KING,MICHAEL	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
689	SUBRAMANIAM,DASA	DAYS INN	332 BAY ST
694	LIPPE, ANDREW	NORTH EAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington Street West
695	LAURICELLA, DIEGO	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
696	CLARIDA, JEFF	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
697	OLAR, GREG	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
698	DEPLONTY, HERBERT	CITY OF SAULT STE MARIE	PUBLIC WORKS PLOWING AREAS
707	FINN, ROBERT	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
708	POWLEY, CHAD	G4S SECURITY	SAULT AREA HOSPITAL
711	MASON, STEPHEN	Riversedge Developments	503 BAY ST
712	KOOSTACHIN, ANDREW	Ontario Finnish Resthome	725 North St
713	Cho, Linda	Jennex Cho Enterprises	129 Second Line West
714	DESANDO, ALEXANDER	G4S SECURITY	SAULT AREA HOSPITAL
715	MITCHELL, SPENCER	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
717	GUY, AMY	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
718	SCOTLAND, KEVIN	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
723	ROCCA, ANTHONY	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
724	ROULEAU, MICHEAL	CORPS OF COMM	SAULT AIRPORT
725	PAAT, EMMA LEE	AIRPORT	SAULT AIRPORT
727	CLARK, DYLAN	G4S SECURITY	SAULT AREA HOSPITAL
731	NOTT, REGINALD	CORPS OF COMM	SAULT AIRPORT
733	GREGORCHUK, CATHERINE	REAL ESTATE STOP INC	2 QUEEN STREET WEST
735	KEMP, ROBERT	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
736	BLAIR, BRENT	PROPERTY ONE	421 BAY ST
737	MARTONE, DONATO	PROPERTY ONE	421 BAY ST/ ST BERNARDS 1139 QUEEN ST E / 303 MACDONALD AVE / 405 QUEEN ST E
740	VERMA, ABBISHEK	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W/1139 Queen /303 MacDonald/405 Queen
741	DEGASPARRO, SHERRI	AIRPORT	SAULT AIRPORT
742	VOWELS-WING, LAURIE	NORTH 44 PROPERTY MGT	844 & 860 QUEEN ST E, 524,524A,536,& 536A GOULAIS AVE
743	MILNE, GEORGE	CROATIAN VILLAGE	80 SACKVILLE RD
744	MCLEAN, JEFF	SKYLINE LIVING	SKYLINE PROPERTIES/621 MACDONALD AVE
745	QUESNELLE, TIMOTHY	PROPERTY ONE	421 BAY ST/COMMUNITY FIRST CREDIT UNION
746	BELANGER, CARL	PERZIA GROUP	70 EAST ST/ 700 BAY ST
747	SCOTT, RYAN	YMCA	235 MCNABB STREET
748	GRAHAM, TIMOTHY	PINE/ALLARD APTS	751/769 PINE STREET/171 WILLOW AVE/94/108 ALLARD STREET
750	NEVEAU, ERIC	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
751	BRETON, JULIEN	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
752	HARTEN, ARYANNA	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
753	DISANO, RONALD	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
754	DAVIES, RHONDA	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
755	HEIDT, TERRY	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
756	MCCOY, ROBERT	NORPRO SECURITY	DAVEY HOME/QUEENSCENTRE/HURON ST PROPERITES/ALGOMA PUBLIC HEALTH/556 QUEEN STRATHCLAIR DOG& SPORTS/QE ECOMPLEX/JOHN RHODES/726 QUEEN ST
757	WERTH, KARL	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
759	FITTON, MATTHEW	G4S SECURITY	SAULT AREA HOSPITAL
760	FARKAS, DARIEN	G4S SECURITY	SAULT AREA HOSPITAL
761	SLATER, KYLE	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
762	MACKENZIE, JENNA	G4S SECURITY	SAULT AREA HOSPITAL
763	CIOTTI, MARK	DSSAB	SSM HOUSING PROPERTIES
764	PARDY, NATHAN	KC SECURITY	Bellevue Park&Marina, Strathclair Park, James Elliot Park, Roberta Bondar Park&Marina,Pointe Des Chenes, PWT, 556 Queen St E, ADSB& HSCDSB-All Locations.
765	LAPRADE, DANIEL	KC SECURITY	Bellevue Park&Marina, Strathclair Park, James Elliot Park, Roberta Bondar Park&Marina,Pointe Des Chenes, PWT, 556 Queen St E, ADSB& HSCDSB-All Locations.
766	PALARO, DONALD	CITY OF SAULT STE MARIE	JOHN RHODES/GFL MEMORIAL GARDENS/MCMEEKEN CENTRE/NORTHERN COMMUNITY CENTRE
767	JOHNSON, DREW	CITY OF SAULT STE MARIE	ROBERTA BONDAR PARK & BELLEVUE MARINA
768	TULLOCH, BRANDON	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
769	WEST, NADINE	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
770	BHARDWAJ, RISHABH	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
771	JANKAR, PAVAN	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
772	SINGH, ARSHPREET	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
773	VERMA, PUNEET	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
774	GILL, HARPREET	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
775	KUMAR, ANKUR	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
776	FRANCE, ADAM	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
777	LONG, CHRISTYNE	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT

778	SEWELL, CAROLYN	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
779	BONIN, THOMAS	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
780	SINGH, GURPREET	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
781	PATEL, JANKI	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
782	PATEL, PARAS	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
783	THOROLD, EDWARD	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
784	MORIN, KEVIN	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
785	SULLIVAN, KASSANDRA	G4S SECURITY	SAULT AREA HOSPITAL
786	DUDGEON, JAMIE	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
787	HINZ, MIKAELA	NORTHEAST SECURITY	S COLLEGE/A UNIVERSITY & RES /ESSAR CENTRE/GHC/CAMBRIAN MALL/TENARIS/JOHN RHODES/QE SPORTS COMPLEX/Algoma Public Health/314 Wellington St W
788	LAPISH, ALEXANDER	ALGOMA STEEL	LOTS OFF WEST & PATRICK ST, KORAH RD, GOULAIS AVE
789	BRUNI, MICHAEL	G4S SECURITY	SAULT AREA HOSPITAL
790	GREGO, JOSHUA	166721 ONTARIO INC	DOCTORS BUILDING - 955 QUEEN ST E
791	SGOURADITIS, RENEE	UNIT PARK	420 QUEEN ST E, 70 FOSTER DR
792	CHAPMAN, DANIEL	ALGOMA STEEL	LOTS OFF WEST & PATRICK ST, KORAH RD, GOULAIS AVE
793	DEEVEY, CODY-LEE	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
794	CHIASSON, VIOLOA	WILLIAMS MCDANIEL	GARDEN COURTS APARTMENTS - 721/731 PINE ST, 62/76 ALLARD ST
795	PLAUNT, DOUGLAS	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
796	SINGH, RAMANDEEP	NEPTUNE SECURITY	SAULT STE MARIE AIRPORT
797	PETERS, JOHNATHAN	HOLIDAY INN EXPRESS	320 BAY STREET
798	ROBINSON, GRANT	HOLIDAY INN EXPRESS	321 BAY STREET
799	VINE, GLEN	HOLIDAY INN EXPRESS	322 BAY STREET
800	GRECO, GIUSEPPE	QUEENSTOWN IDA	302 QUEEN ST E (PROPERTY ON KING ST)
801	FOUCHER, JORDAN	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY
802	ROBERT, LEONARD	NORTHEAST SECURITY	773 GREAT NORTHERN RD (GROUP HEALTH CENTRE)
803	MCMILLAN, TAYLOR	KC SECURITY	CONTRACTED CLIENTS ON PRIVATE PROPERTY

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-115

PARKING: A by-law to appoint by-law enforcement officers to enforce the by-laws of The Corporation of the City of Sault Ste. Marie.

WHEREAS from time to time persons have been appointed by-law enforcement officers;

THEREFORE THE COUNCIL of the Corporation of the City of Sault Ste. Marie pursuant to section 15 of the *Police Services Act*, R.S.O. 1990, chapter p. 15 and amendments thereto, **ENACTS** as follows:

1. **SCHEDULE "A" TO BY-LAW 93-165 REPEALED**

   Schedule "A" to By-law 93-165 is hereby repealed and replaced with Schedule "A" attached to this by-law.

2. **EFFECTIVE DATE**

   This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

da LEGAL\STAFF\COUNCIL\BY-LAWS\2022\2022-115 BY-LAW ENFORCEMENT OFFICERS AMEND 93-165.DOCX

SCHEDULE "A"

Alan Smith	81
Dave Devoe	84
Edward Pigeau	89
George Robinson	94
Bill Long	96
Jason Levesque	101
Brian Ford	104
Sean Miller	107
Timothy Moreland	108
Arian Finlayson	109
James Kemp	110
Anthony McCoy	111
Edward Thorold	112
Lovedeep Sidhu	113
Mattila, Nicole	114

Brady Bishop	125
Orrette Robinson	126
Anthony Rocca	127
Chelsea Dokis	129
Ryan Vendramin	130
Ravi Kumar	131
Daniel Roussain	132
Aashmeen Thind	133
Cody Poirier	134
Jordan Gregorini	135
Michael Steinburg	136
Marc Flumian	137
Michael Heptbourne-Fletcher	138
Rajneesh Kumar	139
Anthony Gallagher	140
Liam Thibault	141
Jason Merrifield	142
Jasinder Singh	143
Riley Higgins	144
Paul Hillier	145
Mikaela Hinz	146
Tyler Stoutenburg	147
Hailey Harris	148
Alexander Pilot	149
Kieran O'Brien	150
Samuel Elliott	152

THE CORPORATION OF THE CITY OF SAULT STE.MARIE

BY-LAW 2022-116

OFFICIAL PLAN AMENDMENT: A by-law to adopt Amendment No. 240 to the Official Plan for the City of Sault Ste. Marie (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson, northern 95 metres of 865 Second Line East)

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 17 of the *Planning Act*, R.S.O. 1990, c. P.13 and amendments thereto, **ENACTS** as follows:

1. The Council hereby adopts Amendment No. 240 to the Official Plan for the Sault Ste. Marie planning area in the form attached hereto.

2. Subject to any referrals under the Planning Act, this by-law shall come into force on the date of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

lv \\citydata\LegalDept\Legal\Staff\LEGAL\ZONING\2022\Second Line East, 865\2022-116 (OP) 865 Second Line E.docx

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-117

ZONING: A by-law to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at the northern 95m of 865 Second Line East (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 34 of the *Planning Act*, R.S.O. 1990, c. P.13 and amendments thereto, **ENACTS** as follows:

1. **865 SECOND LINE EAST; LOCATED ON THE NORTHERN 95M OF 865 SECOND LINE EAST; LOCATED AT THE SOUTHEAST CORNER OF THE PINE STREET AND SECOND LINE EAST INTERSECTION; CHANGE FROM RA TO C4.S WITH A "SPECIAL EXCEPTION"**

   The zone designation on the lands described in Section 2 of this by-law, which lands are shown on Map 72/1-77 of Schedule "A" to By-law 2005-150, is changed from RA (Rural Area) zone to C4.S (General Commercial) zone with a "Special Exception".

2. **BY-LAW 2005-151 AMENDED**

   Section 2 of By-law 2005-151 is amended by adding the following subsection 2(421) and heading as follows:

   "2(421) 865 Second Line East

   Despite the provisions of By-law 2005-150, the zone designation on the lands located on the northern 95 metres of 865 Second Line East and having civic no. 865 Second Line East and outlined and marked "Subject Property" on the map attached as Schedule 421 hereto is changed from RA (Rural Area) zone to C4.S (General Commercial) zone with a "Special Exception" to reduce the required landscaped open space from 50% to 30% for the required exterior side yard only."

3. **SCHEDULE "A"**

   Schedule "A" hereto forms a part of this by-law.

4. **CERTIFICATE OF CONFORMITY**

It is hereby certified that this by-law is in conformity with the Official Plan for the City of Sault Ste. Marie authorized and in force on the day of the passing of this by-law as amended by Official Plan Amendment No. 240.

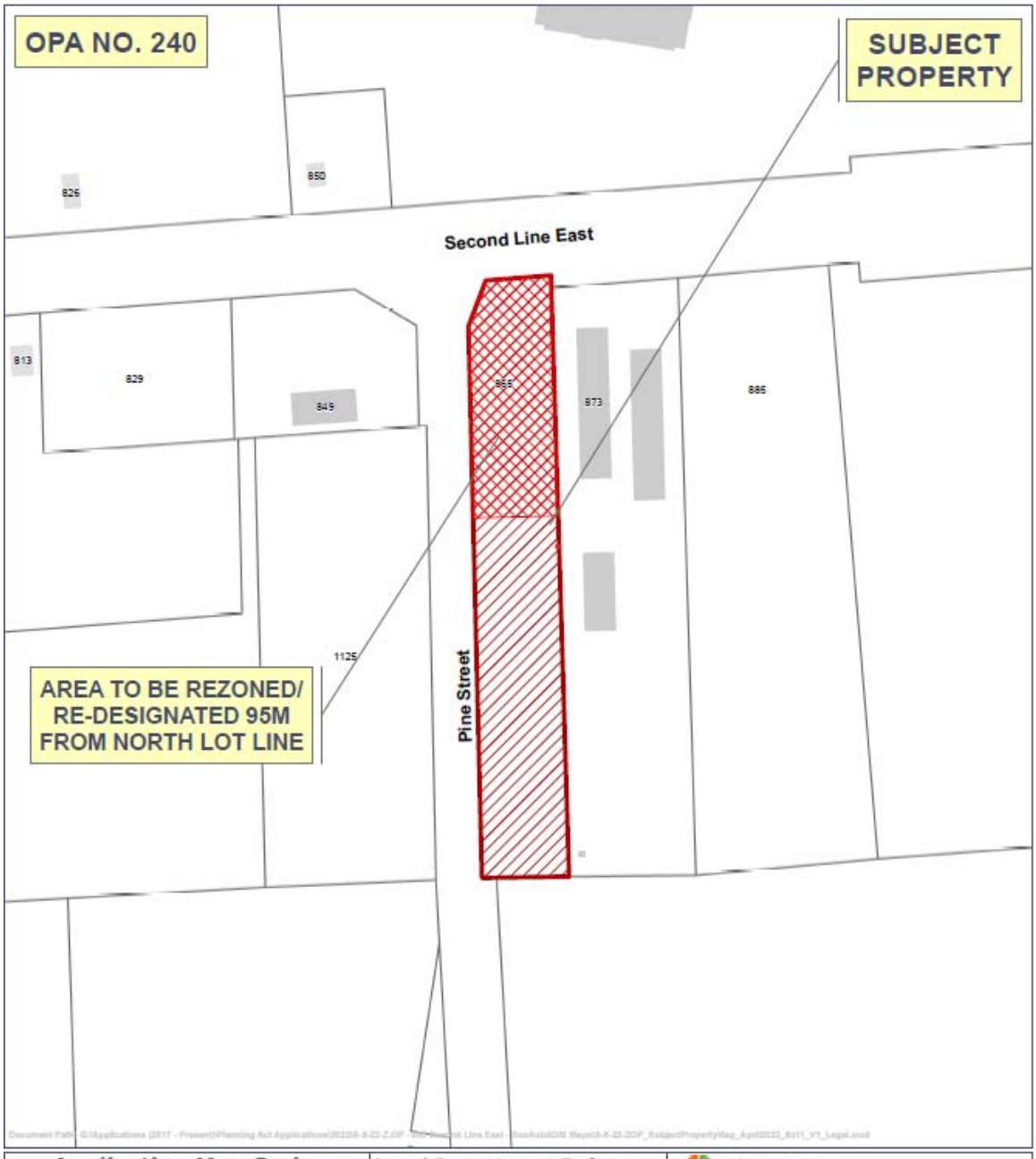
PASSED in Open Council this 13th day of June, 2022.

MAYOR – CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

lv \\citydata\LegalDept\Legal\Staff\LEGAL\ZONING\2022\Second Line East, 865\2022-117 (Z) 865 Second Line E.docx

SCHEDULE “A” TO BY-LAW 2022-117 AND
SCHEDULE 421 TO BY-LAW 2005-151



Application Map Series
☑Subject Property ☐Official Plan Landuse
☐Existing Zoning ☐Aerial Image
☐Official Plan Amendment

Legal Department Reference
Schedule "A"

Property Information
Civic Address: 865 Second Line E
Roll No.: 030080085000000
Map No.: 72/1-77
Application No.: A-5-22-ZOP
Date Created: April 21, 2022

Legend
Subject Parcel
Area To Be Rezoned/Re-Designated
Parcel Fabric

SAULT STE.MARIE
Planning and Enterprise Services
Community Development and Enterprise Services Department
99 Foster Drive, Sault Ste Marie, ON P6A 5X6
saultstemarie.ca | 705-759-5368 | planning@cityssm.on.ca

This map is for general reference only
Orthophoto: None
Projection Details:
NAD 1983 UTM Zone 16N
GCS North American 1983
0 10 20 40 Meters
1:2,000
N

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-118

DEVELOPMENT CONTROL: A by-law to designate the lands located at the northern 95 metres of 865 Second Line East an area of site plan control (2062893 Ontario Inc. o/a Soo Auto, Chris Frees and Candy Johnson).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie **ENACTS** as follows:

1. **DEVELOPMENT CONTROL AREA**

   The lands described on Schedule "A" attached hereto are hereby designated to be an area of site plan control pursuant to section 41 of the *Planning Act*, R.S.O. 1990, c. P. 13 and amendments thereto.

2. **SITE PLAN POWERS DELEGATED**

   The Council hereby delegates to the Planning Director or his/her designate for the City of Sault Ste. Marie, Council's powers to enter into a site plan agreement dealing with any of the works or matters mentioned in Section 41 of the *Planning Act* as amended, for the lands shown as Subject Property on the map attached as Schedule "A" to this by-law.

3. **SCHEDULE "A"**

   Schedule "A" hereto forms a part of this by-law.

4. **PENALTY**

   Any person who contravenes this by-law including the obligations pursuant to the agreement entered into under the authority of this by-law is liable upon conviction therefore to penalty provisions as contained in the *Planning Act* and the *Municipal Act, 2001.*

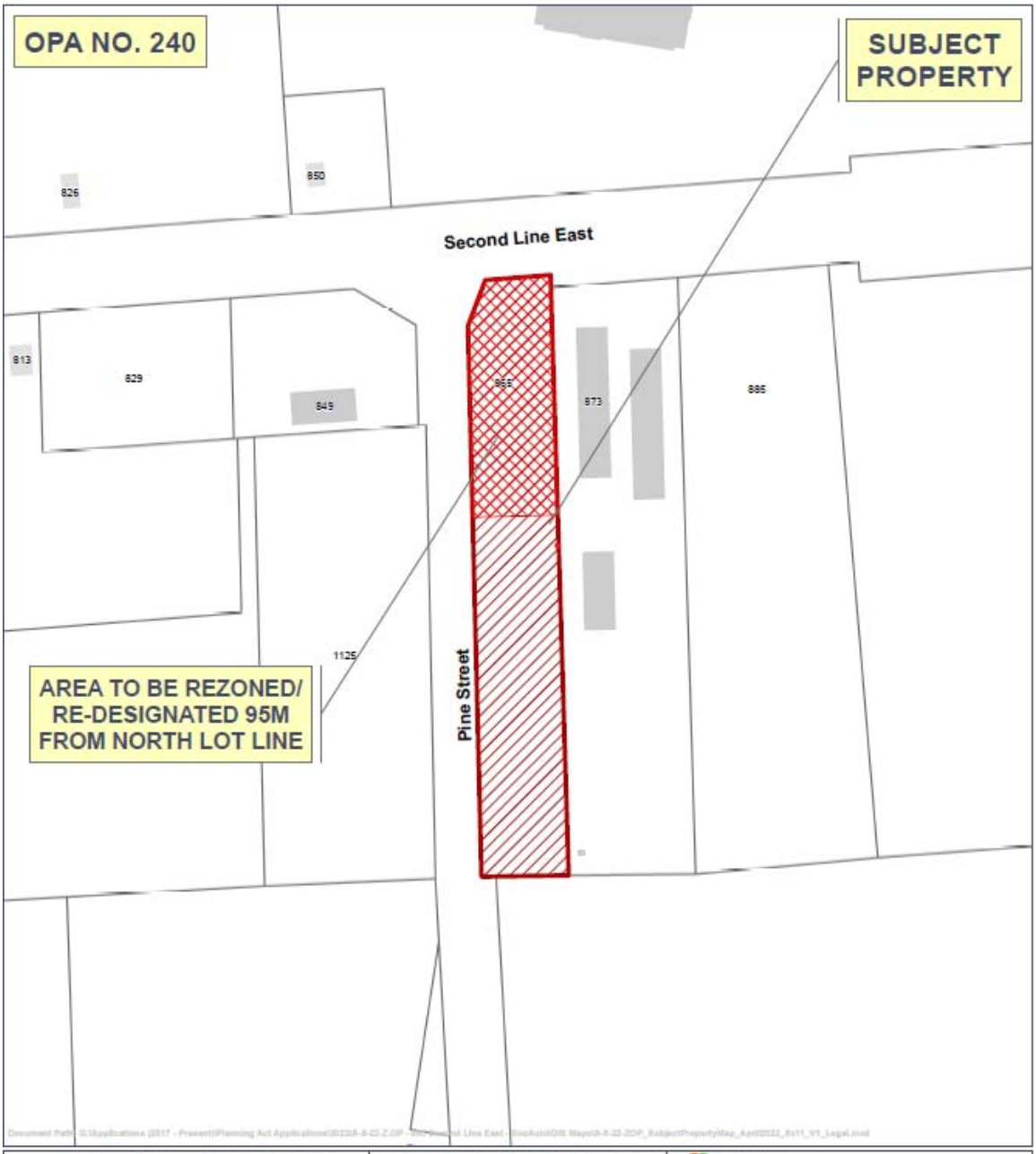
5. **EFFECTIVE DATE**

   This by-law takes effect from the date of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA



Application Map Series
☑Subject Property ☐Official Plan Landuse
☐Existing Zoning ☐Aerial Image
☐Official Plan Amendment

Property Information
Civic Address: 865 Second Line E
Roll No.: 030080085000000
Map No.: 72/1-77
Application No.: A-5-22-ZOP
Date Created: April 21, 2022

Legal Department Reference
Schedule "A"

Legend
Subject Parcel
Area To Be Rezoned/Re-Designated
Parcel Fabric

SAULT STE.MARIE
Planning and Enterprise Services
Community Development and Enterprise Services Department
99 Foster Drive, Sault Ste Marie, ON P6A 5X6
saultstemarie.ca | 705-759-5368 | planning@cityssm.on.ca

This map is for general reference only
Orthophoto: None
Projection Details:
NAD 1983 UTM Zone 16N
GCS North American 1983
0 10 20 40 Meters
1:2,000
N

THE CORPORATION OF THE CITY OF SAULT STE.MARIE

BY-LAW 2022-119

OFFICIAL PLAN AMENDMENT: A by-law to adopt Amendment No. 239 to the Official Plan for the City of Sault Ste. Marie (Zion Evangelical Lutheran Church, 1035 Wellington Street East, 189 Upton Road and 185 Upton Road).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 17 of the *Planning Act*, R.S.O. 1990, c. P.13 and amendments thereto, **ENACTS** as follows:

1. The Council hereby adopts Amendment No. 239 to the Official Plan for the Sault Ste. Marie planning area in the form attached hereto.

2. Subject to any referrals under the Planning Act, this by-law shall come into force on the date of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

tm\\citydata\LegalDept\Legal\Staff\LEGAL\ZONING\2022\Upton Road, 189 & Wellington St. East, 1035\2022-119 1035 Wellington St. E, 185, 189 Upton Rd OP.docx

AMENDMENT NO. 239
TO THE
SAULT STE. MARIE OFFICIAL PLAN

PURPOSE

This Amendment is an amendment to the Text of the Official Plan as it relates to the Residential Policies of the Plan.

LOCATION

PIN 31538-0269 (LT) LT 90-93 PL 7134 ST. MARY'S; PT LT 117-118 PL 7134 ST. MARY'S AS IN CY4160, T241546; PT EDWARD ST PL 7134 ST. MARY'S CLOSED BY T27438, T239868, T239869, T241058 AS IN CY4160, T29110 EXCEPT THE EASEMENT THEREIN; PT LT 28 PL 30794 ST. MARY'S AS IN T21673 S/T T21673; SAULT STE. MARIE; located on the south west corner of the intersection of Wellington Street and Upton Road, civic no. 1035 Wellington Street East, 185 and 189 Upton Road.

BASIS

This Amendment is necessary in view of a request to permit office space.

Council now considers it desirable to amend the Official Plan.

DETAILS OF THE ACTUAL AMENDMENT & POLICIES RELATED THERETO

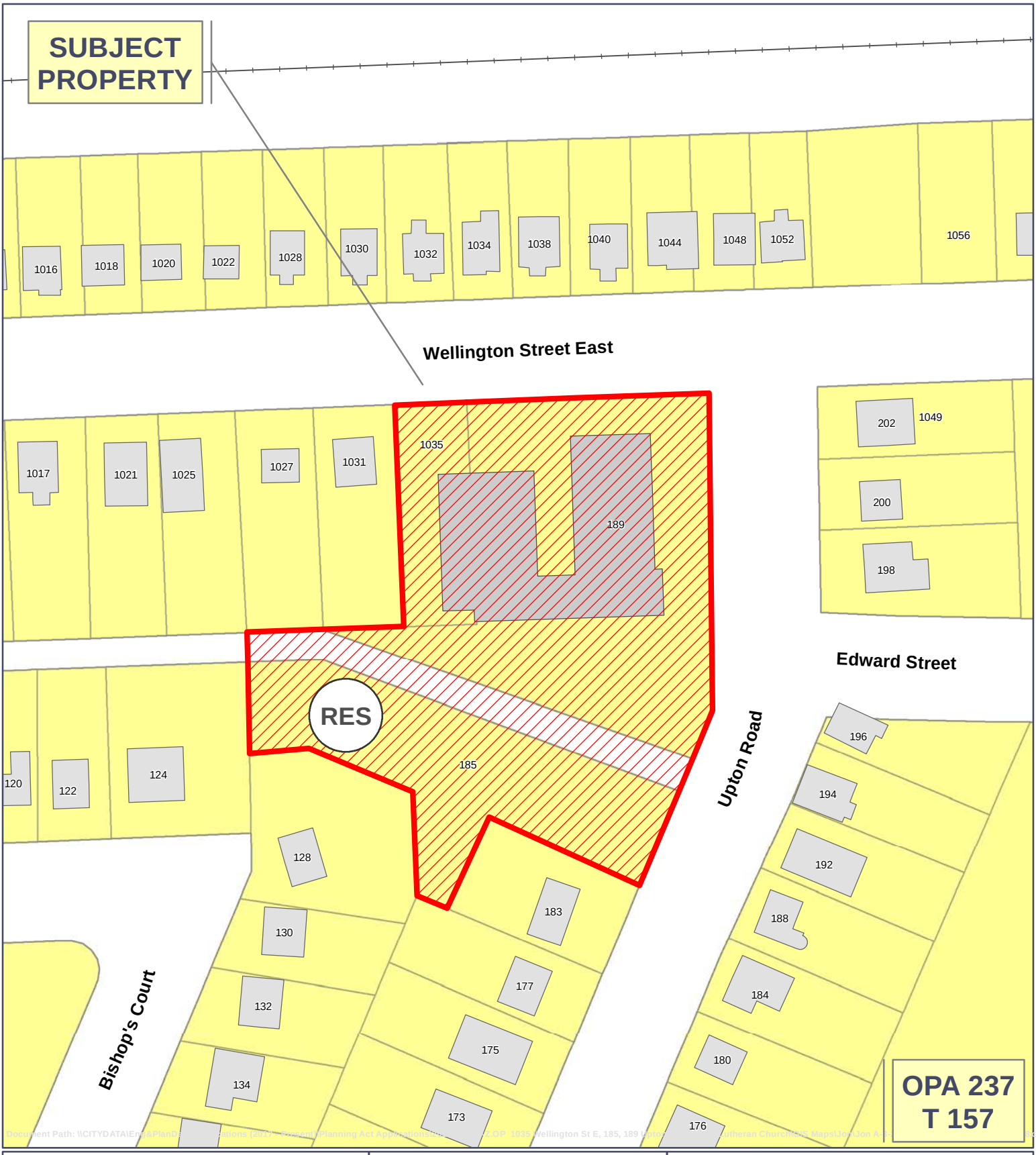
The Official Plan for the City of Sault Ste. Marie is hereby amended by adding the following paragraph to the Special Exceptions Section:

“Special Exceptions”

157. Notwithstanding Residential policies of the Official Plan, the property described as PIN 31538-0269 (LT) LT 90-93 PL 7134 ST. MARY'S; PT LT 117-118 PL 7134 ST. MARY'S AS IN CY4160, T241546; PT EDWARD ST PL 7134 ST. MARY'S CLOSED BY T27438, T239868, T239869, T241058 AS IN CY4160, T29110 EXCEPT THE EASEMENT THEREIN; PT LT 28 PL 30794 ST. MARY'S AS IN T21673 S/T T21673; SAULT STE. MARIE; located on the south west corner of the intersection of Wellington Street and Upton Road, civic no. 1035 Wellington Street East, 185 and 189 Upton Road, may be occupied by up to 325 square meters of office space as an additional permitted use.

INTERPRETATION

The provisions of the Official Plan as amended from time to time will be applied to this Amendment.



Application Map Series

☐Subject Property ☑Official Plan Landuse
☐Existing Zoning ☐Aerial Image
☐Official Plan Amendment

Property Information

Civic Address: 189, 185 Upton Road/1035 Wellington St. E
Roll No.: 020015063000000/020015065000000/ 020015061000000
Map No.: 9
Application No.: A-3-22-Z
Date Created: March 23, 2022

Legend

- Residential
- Commercial
- Institutional
- Parks Recreation
- Industrial
- Rural Area
- Airport Lands
- Parcel Fabric
- Subject Property

SAULT STE.MARIE
Planning and Enterprise Services
Community Development and Enterprise Services Department
99 Foster Drive, Sault Ste Marie, ON P6A 5X6
saultstemarie.ca | 705-759-5368 | planning@cityssm.on.ca

This map is for general reference only
Orthophoto: None
Projection Details:
NAD 1983 UTM Zone 16N
GCS North American 1983

0 5 10 20 Meters
1:1,000

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-120

ZONING: A by-law to amend Sault Ste. Marie Zoning By-laws 2005-150 and 2005-151 concerning lands located at 1035 Wellington Street East, 189 Upton Road and 185 Upton Road (Zion Evangelical Lutheran Church).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 34 of the *Planning Act*, R.S.O. 1990, c. P.13 and amendments thereto, **ENACTS** as follows:

1. **1035 WELLINGTON STREET EAST, 189 UPTON ROAD, 185 UPTON ROAD; LOCATED ON THE SOUTHWEST CORNER OF THE WELLINGTON STREET EAST AND UPTON ROAD INTERSECTION; CHANGE FROM R2 TO R2.S WITH A "SPECIAL EXCEPTION"**

   The zone designation on the lands described in Section 2 of this by-law, which lands are shown on Map 9 of Schedule "A" to By-law 2005-150, is changed from R2 (Single Detached Residential) zone to R2.S (Single Detached Residential) zone with a "Special Exception".

2. **BY-LAW 2005-151 AMENDED**

   Section 2 of By-law 2005-151 is amended by adding the following subsection 2(422) and heading as follows:

   "2(422) 1035 Wellington Street East, 189 Upton Road, 185 Upton Road

   Despite the provisions of By-law 2005-150, the zone designation on the lands located on the southwest corner of the Wellington Street East and Upton Road intersection and having civic no. 1035 Wellington Street East, 189 Upton Road and 185 Upton Road and outlined and marked "Subject Property" on the map attached as Schedule 422 hereto is changed from R2 (Single Detached Residential) zone to R2.S (Single Detached Residential) zone with a "Special Exception" to, in addition to those uses permitted in an R2 zone:

   1. Permit up to 325m^2 of office space.
   2. Reduce the landscaped open space requirement from 30% to 25%.

3. Permit parking spaces to be located in a required exterior side yard within 50 metres of the southerly lot line.
4. Exempt the required 15 parking spaces associated with the office space from surface treatment requirements.
5. Reduce the required number of barrier free parking spaces from 2 to 0 for office space."

3. **SCHEDULE "A"**

Schedule "A" hereto forms a part of this by-law.

4. **CERTIFICATE OF CONFORMITY**

It is hereby certified that this by-law is in conformity with the Official Plan for the City of Sault Ste. Marie authorized and in force on the day of the passing of this by-law as amended by Official Plan Amendment No. 239

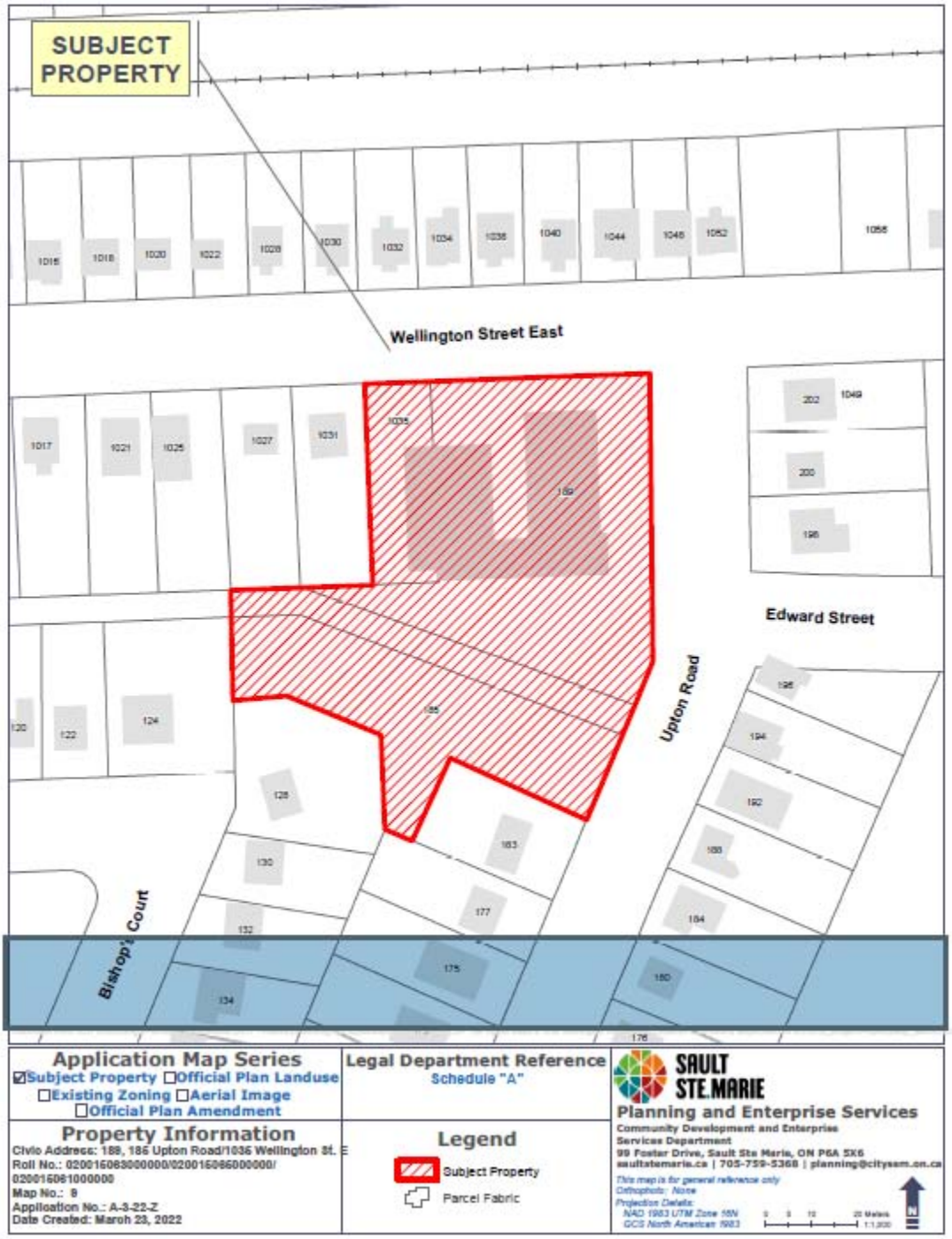
PASSED in Open Council this 13th day of June, 2022.

MAYOR – CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

tm\\citydata\LegalDept\Legal\Staff\LEGAL\ZONING\2022\Upton Road, 189 & Wellington St. East, 1035\2022-120 1035 Wellington St. E, 185, 189 Upton Road Zoning.docx

SCHEDULE “A” TO BY-LAW 2022-120 AND
SCHEDULE 422 TO BY-LAW 2005-151



THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-121

PROPERTY SALE: A by-law to declare the City owned property legally described as PT PIN 31523-0147 (LT) PT PCL 9182 SEC AWS; BLK A PL M381 ST. MARY'S; S/T LT109849; SAULT STE. MARIE being part of civic 15 Creery Avenue (30 feet running the length of the abutting property 186 Breton Road) as surplus to the City's needs and to authorize the disposition of the said property to Chris Briel or as otherwise directed.

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to the *Municipal Act, 2001*, S.0. 2001, c. 25, **ENACTS** as follows:

1. **LANDS DECLARED SURPLUS**

The lands more particularly described in Schedule "A" to this by-law are surplus to the requirements of the municipality.

2. **SALE AUTHORIZED**

The Corporation of the City of Sault Ste. Marie shall sell the lands more particularly described in the attached Schedule "A" to Chris Briel or as otherwise directed at the consideration shown in Schedule "A".

3. **EXECUTION OF DOCUMENTS**

The City Solicitor is hereby authorized by By-law 2018-55 for and in the name of the Corporation to execute and to affix the seal of the Corporation to all documents required to complete the sale.

4. **SCHEDULE "A"**

Schedule "A" hereto forms a part of this by-law.

5. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR – CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

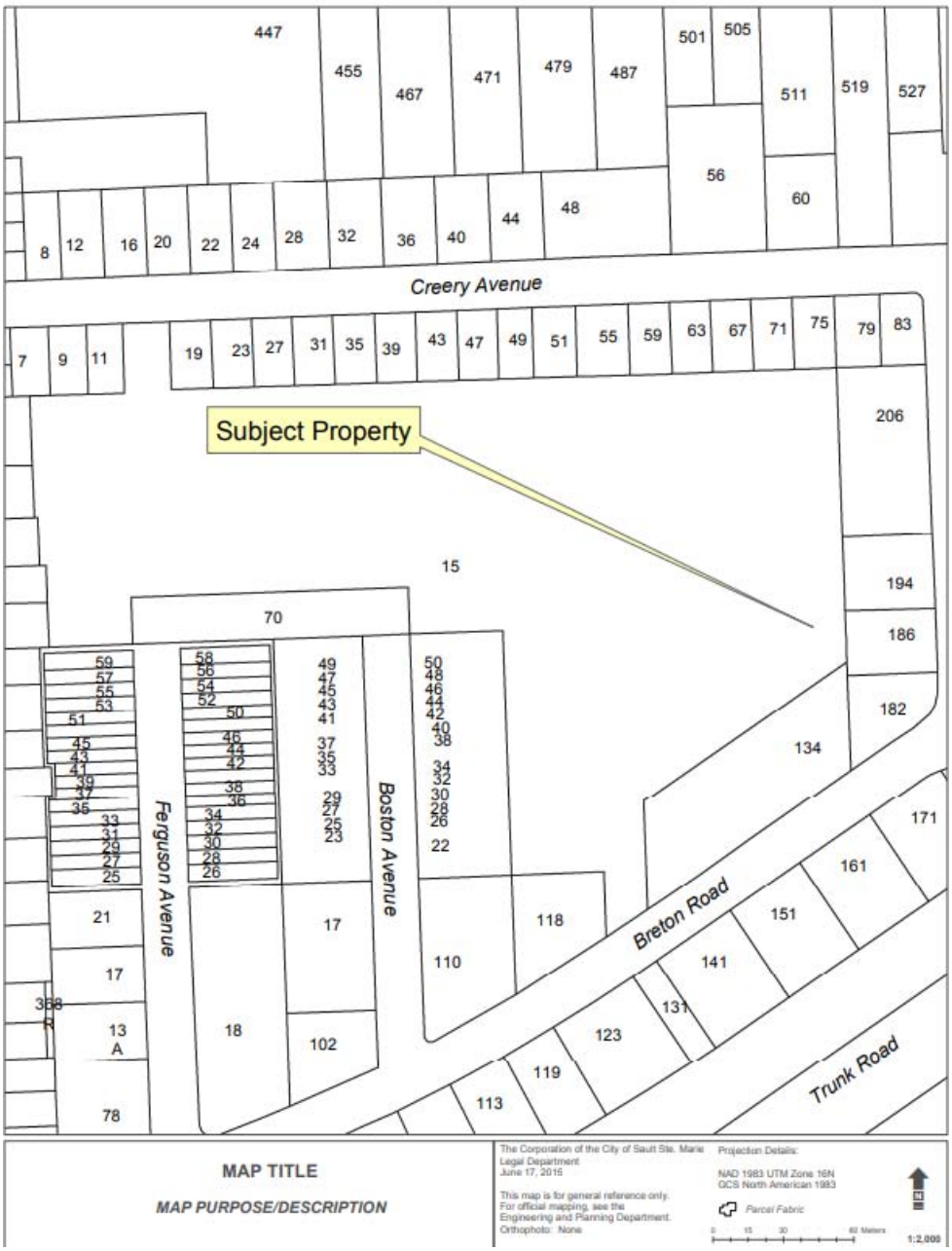
lv \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-121 Pt 15 Creery Surplus and Sale.docx

SCHEDULE "A" TO BY-LAW 2022-121

PURCHASER: Chris Briel

LEGAL DESCRIPTION: Part PIN: 31523-0147 (LT)
PT PCL 9182 SEC AWS; BLK A PL M381 ST. MARY'S; S/T LT109849; SAULT STE. MARIE

CONSIDERATION: ONE THOUSAND ONE HUNDRED ($1100.00) DOLLARS



THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO. 2022-122

PROPERTY: (MAP 232) A by-law to declare the City owned property legally described as PIN 31613-0179 (LT) LT 43 PL 58 AWENGE; SAULT STE. MARIE being civic 97 Victoria Street, as surplus to the City's needs and to authorize the disposition of the said property.

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to the *Municipal Act, 2001*, S.0. 2001, c. 25, **ENACTS** as follows:

1. **LANDS DECLARED SURPLUS**

   The lands more particularly described in Schedule "A" to this by-law are surplus to the requirements of the municipality.

2. **SALE AUTHORIZED**

   The Corporation of the City of Sault Ste. Marie shall sell the lands more particularly described in Schedule "A" hereto.

3. **SCHEDULE "A"**

   Schedule "A" hereto forms part of this by-law.

4. **EFFECTIVE DATE**

   This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

_____

MAYOR - CHRISTIAN PROVENZANO

_____

DEPUTY CITY CLERK – MADISON ZUPPA

lv \\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-122 97 Victoria Surplus OPEN.docx

Schedule “A”

111
107
108
104
1537
103
100
99
Subject Property
97
Victoria Street
Hess Street
145
95
Erie Street
88
133
84
85

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-124

BUILDING: A by-law to provide access for the maintenance of a single family dwelling located at 323 River Road.

WHEREAS Susan Drouin and Laurent Drouin are the registered owners of civic number 323 River Road, Sault Ste. Marie, hereinafter referred to as the "Drouin Property";

AND WHEREAS the owners of the Drouin Property have retained Fraser's Roofing and Siding, ("the Contractor") to perform maintenance and repairs on the single family dwelling at the Drouin Property;

AND WHEREAS Victor Alfano is the registered owner of the adjoining property, namely civic number 327 River Road, Sault Ste. Marie, hereinafter referred to as the "Alfano Property" and has refused entry onto the Alfano Property for the purpose of repairing and restoring the structural integrity of the single family dwelling on the Drouin property;

NOW THEREFORE The Council of The Corporation of the City of Sault Ste. Marie, pursuant to section 132 of the *Municipal Act, 2001,* S.O. 2001, c.2. 25, **ENACTS** as follows:

1. The Contractor shall be allowed to enter onto the Alfano Property for a period not to exceed four (4) weeks from the date of the passing of this by-law to complete the repairs to the siding of the wall of the existing single family dwelling on the Drouin Property that directly abutting and runs parallel to the Alfano Property. This time limit shall expire upon the work being completed.

2. The Contractor shall be allowed entry onto the Alfano Property, not to exceed a distance of eight (8) feet from the property line between the Drouin Property and Alfano Property. For greater certainty, the 8 feet of access allotted to the contractor is to be measured from the exterior wall on the Drouin Property. This access to the Alfano property does not extend to Susan Drouin or Laurent Drouin and only permits the Contractor or their employees to enter onto the Alfano Property.

3. The Alfano Property shall be restored to its original condition following completion of the maintenance to the foundation of the existing single family dwelling on the Drouin Property. Susan Drouin and Laurent Drouin shall provide compensation for any damage caused to the Alfano Property as a result of the maintenance conducted in accordance with this By-law.

4. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

_____

MAYOR – CHRISTIAN PROVENZANO

_____

DEPUTY CITY CLERK – MADISON ZUPPA

\\citydata\LegalDept\Legal\Staff\COUNCIL\BY-LAWS\2022\2022-124 327 River Road Access.doc

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-125

ENGINEERING: A by-law to authorize the execution of the Contract between the City and Avery Construction Limited for the Miscellaneous Construction and Paving Contracts (Contract 2022-10E).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, **ENACTS** as follows:

1. **EXECUTION OF DOCUMENT**

The Mayor and City Clerk are hereby authorized for and in the name of the Corporation to execute and affix the seal of the Corporation to the Contract dated June 13, 2022 between the City and Avery Construction Limited, a copy of which is attached as Schedule “A” hereto. This Contract is for the Miscellaneous Construction and Paving Contracts (Contract 2022-10E).

2. **SCHEDULE "A"**

Schedule "A" forms part of this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

da LEGAL\STAFF\COUNCIL\BY-LAWS\2022\2022-125 AVERY CONSTRUCTION LIMITED CONTRACT 2022-10E.DOCX

CORPORATION OF THE CITY OF SAULT STE. MARIE

CONTRACT 2022-10E

FORM OF AGREEMENT

This Agreement made (in triplicate) this **13th** day of **June** in the year **2022** by and between **Avery Construction Limited** hereinafter called the "Contractor"

AND

The Municipal Corporation of the City of Sault Ste. Marie, Ontario hereinafter called the "Corporation".

WITNESSETH: That the Contractor and the Corporation undertake and agree as follows:

1. The Contractor will provide all the materials and all the works shown and described in the contract documents entitled:

MISCELLANEOUS PAVING AND CONSTRUCTION
CONTRACT 2022-10E

Which have been signed in triplicate by both parties and which were prepared under the supervision of Carl Rumiel, P. Eng., Director of Engineering, acting as and herein entitled, the Owner.

2. The Contractor will do and fulfill everything indicated by the Agreement, the General Conditions, the Specifications, the Special Provisions and the Drawings.

3. The Contractor will complete all the work to the entire satisfaction of the Owner within the period of time specified.

4. The Corporation shall pay to the Contractor the contract price as set forth in the Form of Tender in accordance with the provisions as set forth in the General Conditions and the Special Provisions. The quantities contained in the Form of Tender are approximate only and the final payment shall be made for the actual quantities that are incorporated in or made necessary by the work covered by the contract.

5. The Corporation shall pay the Contractor for work that is ordered in writing by the Owner and that cannot be classified as coming under any of the contract units and for which no unit price, lump sum, or other basis can be agreed upon, on a time and material basis as set out in the General Conditions.

6. The Contractor shall completely indemnify and save harmless the Owner, its employees, officers and agents from any and all claims, demands, actions, losses, expenses, costs or damages of every kind and nature whatsoever and howsoever caused that the Client, its employees, officers or agents may sustain or suffer as a consequence of the actions, inactions or omissions of the Contractor, its employees, agents or officers or as a result of the performance of this Agreement by the Contractor, its employees, agents or officers or as a consequence of the negligent actions or inactions of the Contractor, its employees, agents or officers whether or not the Client is partially or wholly responsible for such claims, demands, actions, losses, expenses, costs or damages.

7. The Contractor shall also indemnify The Public Utilities Commission of the City of Sault Ste. Marie, PUC Distribution Inc. and PUC Services Inc., its officers, employees, agents and affiliates, from all loss, damages, costs, charges and expenses of every nature and kind whatsoever which may be made or brought against The Public Utilities Commission of the City of Sault Ste. Marie, PUC Distribution Inc. and/or PUC Services Inc., its officers, employees, agents and affiliates, by reason

or in consequent of the execution and performance or maintenance of the work by the Contractor, its employees, agents, officers, or those for whom at law the Contractor is responsible.

8. All communications in writing between the Corporation, the Contractor and the Owner shall be deemed to have been received by the Addressee if delivered to the individual, a member of the firm or an officer of the Corporation for whom they are intended or if sent by post as follows:

THE CORPORATION: The Corporation of the City of Sault Ste. Marie
Civic Centre
99 Foster Drive
Sault Ste. Marie, ON P6A 5x6

THE CONTRACTOR: Avery Construction Limited
940 Second Line West
Sault Ste. Marie, ON P6C 2L3

THE OWNER: Mr. Carl Rumiel, P. Eng.
Director of Engineering
Civic Centre
99 Foster Drive
Sault Ste. Marie, ON P6A 5X6

IN WITNESS WHEREOF the parties hereto have executed this Agreement by the day and year first above written.

Signed, Sealed and Delivered
in the presence of

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

MAYOR - CHRISTIAN PROVENZANO

(seal)

CITY CLERK – RACHEL TYCZINSKI

THE CONTRACTOR

COMPANY NAME

(seal)

SIGNATURE

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW 2022-126

ENGINEERING: A by-law to authorize the execution of the Contract between the City and Ellwood Robinson Incorporated for the Resurfacing Contract (Contract 2022-13E).

THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, **ENACTS** as follows:

1. **EXECUTION OF DOCUMENT**

The Mayor and City Clerk are hereby authorized for and in the name of the Corporation to execute and affix the seal of the Corporation to the Contract dated June 13, 2022 between the City and Ellwood Robinson Incorporated, a copy of which is attached as Schedule “A” hereto. This Contract is for the Resurfacing Contract (Contract 2022-13E).

2. **SCHEDULE "A"**

Schedule "A" forms part of this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

PASSED in open Council this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

da LEGAL\STAFF\COUNCIL\BY-LAWS\2022\2022-126 ELLWOOD ROBINSON CONTRACT 2022-13E.DOCX

CORPORATION OF THE CITY OF SAULT STE. MARIE

CONTRACT 2022-13E

FORM OF AGREEMENT

This Agreement made (in triplicate) this **13th** day of **June** in the year **2022** by and between **Ellwood Robinson Incorporated** hereinafter called the "Contractor"

AND

The Municipal Corporation of the City of Sault Ste. Marie, Ontario hereinafter called the "Corporation".

WITNESSETH: That the Contractor and the Corporation undertake and agree as follows:

1. The Contractor will provide all the materials and all the works shown and described in the contract documents entitled:

RESURFACING CONTRACT
CONTRACT 2022-13E

Which have been signed in triplicate by both parties and which were prepared under the supervision of Carl Rumiel, P. Eng., Director of Engineering acting as and herein entitled, the Owner.

2. The Contractor will do and fulfill everything indicated by the Agreement, the General Conditions, the Specifications, the Special Provisions and the Drawings.

3. The Contractor will complete all the work to the entire satisfaction of the Owner within the period of time specified.

4. The Corporation shall pay to the Contractor the contract price as set forth in the Form of Tender in accordance with the provisions as set forth in the General Conditions and the Special Provisions. The quantities contained in the Form of Tender are approximate only and the final payment shall be made for the actual quantities that are incorporated in or made necessary by the work covered by the contract.

5. The Corporation shall pay the Contractor for work that is ordered in writing by the Owner and that cannot be classified as coming under any of the contract units and for which no unit price, lump sum, or other basis can be agreed upon, on a time and material basis as set out in the General Conditions.

6. The Contractor shall completely indemnify and save harmless the Owner, its employees, officers and agents from any and all claims, demands, actions, losses, expenses, costs or damages of every kind and nature whatsoever and howsoever caused that the Client, its employees, officers or agents may sustain or suffer as a consequence of the actions, inactions or omissions of the Contractor, its employees, agents or officers or as a result of the performance of this Agreement by the Contractor, its employees, agents or officers or as a consequence of the negligent actions or inactions of the Contractor, its employees, agents or officers whether or not the Client is partially or wholly responsible for such claims, demands, actions, losses, expenses, costs or damages.

7. The Contractor shall also indemnify The Public Utilities Commission of the City of Sault Ste. Marie, PUC Distribution Inc. and PUC Services Inc., its officers, employees, agents and affiliates, from all loss, damages, costs, charges and expenses of every nature and kind whatsoever which may be made or brought against The Public Utilities Commission of the City of Sault Ste. Marie, PUC Distribution Inc. and/or PUC Services Inc., its officers, employees, agents and affiliates, by reason

or in consequent of the execution and performance or maintenance of the work by the Contractor, its employees, agents, officers, or those for whom at law the Contractor is responsible.

8. All communications in writing between the Corporation, the Contractor and the Owner shall be deemed to have been received by the Addressee if delivered to the individual, a member of the firm or an officer of the Corporation for whom they are intended or if sent by post as follows:

THE CORPORATION: The Corporation of the City of Sault Ste. Marie
Civic Centre
99 Foster Drive
Sault Ste. Marie, ON P6A 5X6

THE CONTRACTOR: Ellwood Robinson Incorporated
2075 Great Northern Road
Sault Ste. Marie, ON P6A 5K7

THE OWNER: Mr. Carl Rumiel, P. Eng.
Director of Engineering
Civic Centre
99 Foster Drive
Sault Ste. Marie, ON P6A 5X6

IN WITNESS WHEREOF the parties hereto have executed this Agreement by the day and year first above written.

Signed, Sealed and Delivered
in the presence of

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

MAYOR - CHRISTIAN PROVENZANO

(seal)

CITY CLERK – RACHEL TYCZINSKI

THE CONTRACTOR

COMPANY NAME

(seal)

SIGNATURE

THE CORPORATION OF THE CITY OF SAULT STE. MARIE

BY-LAW NO 2022-108

STREET/LANE CLOSING: A by-law to stop up, close and authorize the conveyance of various streets/lanes in the Downtown Plaza.

WHEREAS the streets/lanes more particularly described in Schedule "A" attached were established as public streets/lanes and assumed for public use by By-law 2022-107;

NOW THEREFORE THE COUNCIL of The Corporation of the City of Sault Ste. Marie, pursuant to *the Municipal Act, 2001*, S.O. 2001, **ENACTS** as follows:

1. **STREETS/LANES CLOSED**

The streets/lanes or part of streets/lanes more particularly described in Schedule "A" to this by-law, having been assumed by the Corporation for public use, are hereby stopped up and closed:

2. **EXECUTION OF DOCUMENTS**

The City Solicitor is hereby authorized by By-law 2018-55 for and in the name of the Corporation to execute and to affix the seal of the Corporation to all documents required to give effect to this by-law.

3. **EFFECTIVE DATE**

This by-law takes effect on the day of its final passing.

READ the **FIRST** and **SECOND** time in open Council this 24th day of May, 2022.

MAYOR - CHRISTIAN PROVENZANO

CITY CLERK – RACHEL TYCZINSKI

da LEGAL\STAFF\COUNCIL\BY-LAWS\2022\BY-LAW 2022-108 CLOSE STREETS AND LANES - DOWNTOWN PLAZA.DOCX

STREET/LANE CLOSING: A by-law to stop up, close and authorize the conveyance of various streets/lanes in the Downtown Plaza.

Read the **THIRD** time in open Council and passed this 13th day of June, 2022.

MAYOR - CHRISTIAN PROVENZANO

DEPUTY CITY CLERK – MADISON ZUPPA

da LEGAL\STAFF\COUNCIL\BY-LAWS\2022\2022-108 THIRD READING.DOCX

SCHEDULE "A" TO BY-LAW 2022-108

- 15 FOOT LANE PLAN 366MCD ST. MARY'S NORTH OF LOTS 15 TO 17; SAULT STE. MARIE (PIN 31542-0308 (LT));

- 15 FOOT LANE PLAN 366MCD ST. MARY'S SOUTH OF LOTS 4 TO 6; SAULT STE. MARIE (PIN 31542-0309 (LT));

- MCDOUGALD STREET PLAN 366MCD ST. MARY'S NORTH OF T219159 (ALSO KNOWN AS BINGHAM STREET); SAULT STE. MARIE; (PIN 31542-0310 (LT));

- 2 FOOT RESERVE PLAN 366 MCD ST. MARY'S SOUTH OF LOT 6; SAULT STE. MARIE (PIN 31542-0357 (LT)); and

- 2 FOOT RESERVE PLAN 366 MCD ST. MARY'S NORTH OF LOT 17; SAULT STE. MARIE (PIN 31542-0351 (LT)).

THIS DRAWING DOES NOT FORM PART OF THE BY-LAW. IT IS FOR INFORMATION PURPOSES ONLY.