VERNE REIMER
ARCHITECTURE
INCORPORATED

PROJECT MANUAL

Rural Municipality of Hanover
Grunthal Arena Southern Expansion
Grunthal, Manitoba

VRA PROJECT 2024.01200

ISSUED FOR CONSTRUCTION
2026.06.03

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Project	Grunthal Arena Expansion
VRA Project No.	2024.01200
Located at	64 Albert Avenue Grunthal Manitoba
Owner	Rural Municipality of Hanover
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.2 Use the Product Substitution Request Form appended to Section 01 25 13 - Product Substitution Procedures.

1.2 PROPOSED SUBSTITUTIONS

.1 The Work is based on the Materials and methods specified in the specifications. Proprietary names used in these bid documents are intended to establish a standard of quality and are not meant to exclude products of other manufacturers.

.2 Proposals to substitute a specified material with alternative material will be considered during the bid period if received by the Consultant on or before the final date for receipt of requests for substitutions as specified in the Instructions to Bidders.

.3 Substitutions are not permitted without prior approval of the Consultant.

.4 To be considered, each proposal must:

.1 Include sufficient information to enable the Consultant to properly evaluate the material. Such information shall include manufacturer's data, specifications, or other pertinent data to completely describe the products.

.2 Identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute.

.5 The Consultant may:

.1 Reject the proposed substitution; or

.2 Accept the proposed substitution and designate the material as an "acceptable material"; or

.3 Designate the proposed substitution as an "alternative material".

.6 If the Consultant approves a proposed substitution as an "acceptable material" any bidder may use the approved material in place of the specified material.

.7 If the Consultant approves a proposed substitution as an "alternative material" bidders shall base their bids on the specified material or Consultant approved "acceptable material" only. Bidders may provide an alternative price for the approved "alternative material" at their discretion. Consultant will consider alternative prices after bid closing.

.8 Only Consultant approved substitutions will be communicated to bidders in written Addenda. No verbal approvals will be given or implied. Only substitutions listed in the Addenda may be used on the project.

.9 The Consultant reserves the right to accept or reject any proposal without prejudice for any reason whatsoever and reserves the right to disclose or not to disclose his reasons for such rejection.

.10 Requests that are late, incomplete, ambiguous or do not contain sufficient information to allow the Consultant to properly evaluate the proposal may be rejected.

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.11 A request constitutes a representation that the Bidder:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product and is so certifying that the proposed substitute will fully perform the functions called for by the general design.

.2 The proposed substitution will be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule.

.3 Will provide the same warranty for the Substitution as for the specified Product.

.4 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

.5 Waives claims for additional costs or time extension which may subsequently become apparent.

Will reimburse Owner and Consultant for review or redesign services associated with re-approval by authorities.

END OF SECTION

1.1 TOPOGRAPHICAL SURVEY

.1 Completed by KGS Group dated December 4, 2025

.2 A copy of the survey is bound into the Project Manual as Appendix A to this Section.

1.2 GEOTECHNICAL REPORT

.1 Completed by KGS Group dated March 27, 2026

.2 A copy of the report is bound into the Project Manual as Appendix B to this Section.

1.3 BUILDING LOCATION CERTIFICATE

.1 Completed by Keystone Surveys dated April 13, 2026

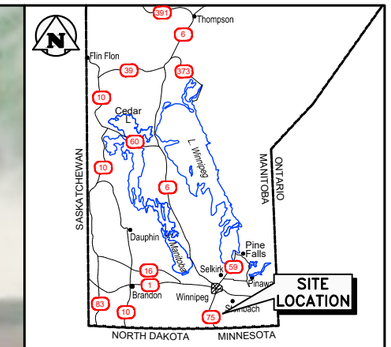
.2 A copy of the certificate is bound into the Project Manual as Appendix C to this Section.

1.4 ASBESTOS SURVEY REPORT

.1 Completed by MWI Consultants dated January 15, 2024

.2 A copy of the report is bound into the Project Manual as Appendix D to this Section.

11x17V2.1



KEY MAP:

LEGEND:

—— - - ——	VALLEY FIBRE
—— GAS ——	GAS
	HYDRANT
	VALVE
	MAINTENANCE HOLE
	HYDRO POLES
	GUY WIRE
	LIGHT STANDARD
	TREE
	SURVEY BAR

NOTES:

1. TOPOGRAPHIC DATA WAS CAPTURED BY KGS GROUP SURVEY ON DECEMBER 4, 2025.
2. IMAGERY SOURCED FROM ESRI.
3. ALL UNITS ARE METRIC AND IN METRES UNLESS OTHERWISE SPECIFIED. TRANSVERSE MERCATOR PROJECTION, NAD 1983, CSRS ZONE 14. ELEVATIONS ARE VERTICAL DATUM CGVD28 AND IN METRES ABOVE SEA LEVEL (MSL).

10 0 10 20 30m

SCALE: 1:800 METRIC

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
0	26/01/08	ISSUED FOR INFORMATION	JIC	CRS

KGS GROUP

Hanover MUNICIPALITY

TOPOGRAPHIC SURVEY
GRUNTHAL ARENA
GRUNTHAL, MB

EXISTING CONDITIONS PLAN

JANUARY 2026 | FIGURE 01 | REV: 0

Filename: R:\Projects\2025\25-0604-001\Design\GIS\C3D\25-0604-001 Grunthal Base.dwg - Tab:Fig01 Plotted By: DWatson 26/01/08 [Thu 1:22pm]
11"x17" PLOT SCALE: 1"=2'

RURAL MUNICIPALITY OF HANOVER

Grunthal Arena Expansion – Geotechnical Engineering Report

Revision:

Final Rev 0

KGS Group Project:

26-0604-001

Date:

March 27, 2026

KGS GROUP

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Certificate of Authorization
KGS Group
No. 245

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STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for Rural Municipality of Hanover in accordance with the agreement between KGS Group and Rural Municipality of Hanover (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

This report is based on information made available to KGS Group by Rural Municipality of Hanover. Unless stated otherwise, KGS Group 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. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of these services. The information and conclusions provided in this report apply only as they existed at the time KGS Group's services were completed.

Third Party Use of Report

Any use a third party makes of this report or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

Geotechnical Investigation Statement of Limitations

The geotechnical investigation findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. The findings and recommendations are based on the results of field and laboratory investigations, combined with an interpolation of soil and groundwater conditions found at and within the depth of the test holes drilled by KGS Group at the site at the time of drilling. If conditions encountered during construction appear to be different from those shown by the test holes drilled by KGS Group or if the assumptions stated herein are not in keeping with the design, KGS Group should be notified in order that the recommendations can be reviewed and modified if necessary.

1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by the Rural Municipality of Hanover to provide geotechnical services for the proposed Arena Expansion in Grunthal, Manitoba.

This geotechnical report summarizes the findings of the geotechnical investigation as described in the scope of services outlined in KGS Group's proposal titled "***Grunthal Arena Expansion – RM of Hanover, Manitoba Proposal for Geotechnical Engineering Services"*** dated October 22, 2025.

The main components of the geotechnical site investigation included:

- A subsurface investigation consisting of three (3) deep test holes advanced to depths ranging from approximately 10.7 to 13.7 m (35 to 45 ft) below ground surface (BGS) within the proposed building expansion footprint, and four (4) shallow test holes advanced to a depth of 3.0 m (10 ft) within access road and parking areas;
- Field testing, including Standard Penetration Tests (SPTs) completed as appropriate during drilling operations;
- A laboratory testing program including moisture content determinations and particle size analyses;
- Comprehensive review and analysis of the findings obtained from the site investigation and laboratory testing program; and
- A geotechnical report (this report) outlining the field and laboratory test results, and geotechnical design recommendations and other construction considerations.

2.0 PROJECT UNDERSTANDING

The project site is located adjacent to the existing arena located at 63 Albert Avenue, in Grunthal, Manitoba, approximately 58 km southeast of Winnipeg. The project site is bounded by Park Street to the north, Southwood Avenue to the south, Albert Avenue to the east, and green space to the west. The existing arena is quite basic with wooden bleachers, changing rooms and shower rooms. KGS Group's structural team has informed the geotechnical department that the existing arena structure is likely bearing on shallow footings at an embedment depth of approximately 1.2 m (4 ft) BGS. However, the actual foundation type is unknown. To limit differential movements between existing buildings and additions it is generally recommended that similar foundation types be used. Therefore, it is critical for the project to determine the actual foundation type for the existing structure. The recommendations provided in this report are based on the educated assumption that the existing building is bearing on shallow footings.

The preliminary architectural drawings provided indicate that the scope of work includes demolition of the existing public concourse and construction of a south addition of approximately 998 m^2 (10,742 ft^2) to accommodate viewing stands, change rooms, locker rooms, washrooms, a kitchen, and storage areas. A north addition of approximately 117 m^2 (1,259 ft^2) is also proposed to house a re-surfacer room and ice plant.

Based on the preliminary architectural drawings provided by the client KGS Group has assumed the proposed additions will consist of wood or steel frame construction, that the structures will be heated, and that they will not include basements or crawl spaces. A copy of the preliminary architectural drawings provided by the client are included in Appendix A. If building details differ from those outlined above KGS Group should be contacted to determine if updates to the recommendations provided in this report are required.

3.0 INVESTIGATION PROGRAM

3.1 Utility Clearance

KGS Group obtained public and private underground utility clearances at the project site to identify and mark any existing underground and overhead utilities within the work area prior to conducting the test hole drilling program. The public utility locate process revealed that there were several buried utilities located within and adjacent to the existing arena on the south side of the building. KGS Group sub-contracted Accurate Underground and identified locations of all buried public and private utilities on February 9, 2026, prior to conducting the test hole drilling program. The utility clearances were reviewed on site with the drilling subcontractor prior to drilling.

Due to the congestion of buried utilities around the proposed outbuilding footprint and within the area on the south side of the arena, KGS Group field staff moved one of the test holes further south to maintain the required 3 m setback from all utilities.

3.2 Test Hole Drilling and Sampling

A drilling and sampling program was completed between February 9 and 11, 2026, under continuous supervision by KGS Group, with drilling services provided by Maple Leaf Drilling (MLD) of Winnipeg, Manitoba. Drilling was performed using an Acker MP5 track mounted geotechnical drill rig equipped with 125 mm diameter solid stem augers, 200 mm diameter hollow stem augers, and a Standard Penetration Test (SPT) safety drop hammer. Within the proposed building addition footprint, three (3) deep test holes (TH26-01, TH26-06, and TH26-07) were completed to depths ranging from 10.7 to 13.7 m (35 to 45 ft), and four (4) shallow test holes (TH26-02 to TH26-05) were completed in the proposed parking area to an approximate depth of 3.0 m (10 ft).

Excessive sand heaving was observed at an approximate depth of 7.9 m (26 ft) BGS within TH26-01. In the absence of on-site water supply to control the heaving, installation of the standpipe piezometer was not possible.

During drilling at the originally proposed location the north garage and ice plant (TH26-07), cobbles and boulders prevented advancement of the augers beyond 1.5 m (5 ft) BGS. After several attempts to get past the obstruction the test hole was shifted approximately 20 m to the east.

Representative soil samples were obtained from all test holes at 0.75 to 1.5 m (2.5 to 5 ft) intervals or at any change in soil strata. Soil samples were collected directly off the auger, or from a split spoon sampler, and were visually classified in the field in general accordance with the modified Unified Soil Classification System (USCS). SPTs were completed in non-cohesive soil at intervals of 1.5 m (5 ft) to assess relative density. Upon completion of drilling, test holes were backfilled with soil cuttings and bentonite chips to the surface.

The UTM coordinates and ground surface elevations were collected using a Trimble Catalyst GPS unit with an accuracy of ±10 cm and are listed below in Table 1. The test hole locations are shown in Image 1 below.

TABLE 1: SUMMARY OF TEST HOLE LOCATIONS

Test Hole ID	Location	Surface Elevation (m)	UTM Coordinates (Zone 14)		Depth BGS (m)
			Northing (m)	Easting (m)	
TH26-01	Southwest end of the proposed southern extension	269.26	5,474,551.74	655,419.59	12.19
TH26-02	Southwest section of the parking	269.27	5,474,528.93	655,427.00	3.19
TH26-03	Middle section of the parking area	269.29	5,474,541.60	655,444.51	3.29
TH26-04	Southeast section of the parking	269.41	5,474,530.66	655,454.35	3.20
TH26-05	Northeast section of the parking	269.34	5,474,563.81	655,448.29	3.20
TH26-06	Northeast of the proposed southern extension	269.26	5,474,579.98	655,442.68	14.17
TH26-07	Approx 20 m east of the proposed north garage and ice plant extension	269.03	5,474,659.34	655,440.38	10.85

Note: Test hole coordinates and elevations were collected with a Trimble Catalyst GPS unit with an accuracy of ±10 cm.

IMAGE 1: TEST HOLE LOCATION PLAN

3.3 Laboratory Testing

Laboratory tests were completed on representative soil samples to assess index properties for correlation to relevant engineering properties. Testing was completed in Winnipeg, Manitoba at a certified laboratory by the Canadian Council of Independent Laboratories (CCiL). The testing included 30 moisture contents and four (4) particle size analyses. Laboratory test results are included on the summary test hole logs and laboratory test reports provided in Appendix B and Appendix C, respectively.

4.0 INVESTIGATION RESULTS

4.1 Stratigraphy

In general, the soil stratigraphy across the project site consisted of surficial layers of silty sand, overlying a deep deposit of poorly graded sand with silt (SP-SM) in TH26-01 and TH26-06, south of the arena, and well graded sand with silt (SW-SM) in TH26-07, north of the arena. A detailed description of the soil stratigraphy encountered at the project site is provided below. A summary test hole logs of the soil conditions profiles are provided in Appendix B, and attached Figure 1 is a fence diagram of the soil profile encountered across the site.

Silty Sand (SM) – Silty sand was encountered at the surface in all test holes, ranging in thickness from 3.0 to 4.6 m (10 to 15 ft). Silty sand was generally observed to be fine to coarse grained, light brown to brown in colour, and dry to moist. Frozen soils to a depth of 0.3 m were recorded in TH26-06 with temperature of -1.2 °C, all other readings below 0.3 m BSG ranged from 3.0 to 6.0 °C.

A total of 14 SPTs were completed within the silty sand layer indicating uncorrected N- values ranging to 31 to 100+ blows, classifying silty sand as dense to very dense in terms of relative density. Two particle size analyses were completed on silty sand layer indicating 2% gravel, 59 to 74% sand, 19 to 30% silt, and 5 to 9% clay. Based on the particle size analysis results, the silty sand has high frost susceptibility. The moisture content of the silty sand ranged from 2 to 13% based on 15 tests.

Poorly Graded Sand with Silt (SP-SM) – A layer of poorly graded sand with silt was encountered below the silty sand in test holes TH26-01 and TH26-06 and extended to the depth explored, 7.6 to 9.1 m (25 to 30 ft) BGS, respectively. The poorly graded sand with silt was generally fine grained, light brown in colour, and damp to wet.

A total of 11 SPTs were completed within the poorly graded sand with silt layer indicating uncorrected N-values of 100+ blows, classifying the poorly graded sand with silt as very dense in terms of relative density. One (1) particle size analysis was completed on a sample from 7.3 m (24 ft) in test hole TH26-01 indicating 0% gravel, 93% sand, 5% silt, and 2% clay. The particle size analysis results classifying the poorly graded sand with silt has low to medium frost susceptibility. The moisture content of the poorly graded sand with silt ranged from 2 to 21 % based on nine (9) tests.

Well Graded Sand with Silt (SW-SM) – Well graded sand with silt was encountered below the silty sand in test hole TH26-07 below a depth of 3.0 m (10 ft) BGS and extended to depth 10.7 m (35 ft) BGS. The well graded sand with silt was fine to coarse grained, brown in colour, and moist to wet. and very dense.

Six (6) SPTs were completed within the well graded sand with silt layer resulting with uncorrected N-values of 100+ blows, classifying the soil layer as very dense in terms of relative density. A particle size analysis was completed on sample from 7.6 m (25 ft) BGS in test hole TH26-07 indicating 1% gravel, 87% sand, 9% silt, and 3% clay. Based on the particle size analysis results, the well graded sand with silt has low to medium frost susceptibility. The moisture content of the well graded sand with silt ranged from 5 to 20 % based on six (6) tests.

4.2 Groundwater, Seepage, and Sloughing Conditions

Groundwater seepage and soil sloughing conditions were recorded during and upon completion of drilling for each test hole. The groundwater seepage and soil sloughing conditions observed within the completed test holes and are summarized in Table 2 below.

TABLE 2: OBSERVED GROUNDWATER AND SLOUGHING CONDITIONS

Test Hole ID	Test Hole Depth (m)	Observed Depth During Drilling (m)	Depth Upon Completion of Drilling (m)	Observed Sloughing Conditions Upon Completion
TH26-01	12.19	8.08	7.92	Caved to 7.92 m upon completion of drilling.
TH26-02	3.19	None encountered	None encountered	Remained open to 3.19 m upon completion of drilling.
TH26-03	3.29	None encountered	None encountered	Remained open to 3.29 m upon completion of drilling.
TH26-04	3.20	None encountered	None encountered	Remained open to 3.20 m upon completion of drilling.
TH26-05	3.20	None encountered	None encountered	Remained open to 3.20 m upon completion of drilling.
TH26-06	14.17	7.92	7.92	Caved to 13.44 m upon completion of drilling.
TH26-07	10.85	9.14	Dry after drilling	Caved to 8.84 m upon completion of drilling.

Groundwater infiltration was observed during drilling in test holes TH26-01, TH26-06, and TH26-07 from the sand layers (SP-SM and SW-SM) at depths of 8.08 m (26.5 ft), 7.92 m (26 ft), and 9.14 m (30 ft) BGS, respectively. Following completion of drilling, the groundwater depths recorded were at 7.92 m (26 ft) BGS in both test holes TH26-01 and TH26-06. Test hole TH26-07 was dry upon completion of drilling.

The proposed standpipe piezometer installation in TH26-01 was omitted due to severe sand heaving and the absence of on-site water supply to control these conditions. To obtain a stabilized groundwater level reading the hollow stem augers were left in place overnight and the groundwater level within was recorded the following day.

Based on these observations, significant groundwater inflows are not anticipated in open excavations for installation of shallow foundations and buried utilities to a maximum depth of approximately 3.0 m. However, silty sand is very sensitive to the change of groundwater levels which may have significant groundwater inflow conditions if the groundwater level rises. Groundwater levels will fluctuate seasonally and following precipitation events; hence, the actual water level at the time of construction could be differ from the conditions observed on site.

4.3 Potential Difficult Ground Conditions

Groundwater seepage and soil sloughing should be anticipated when excavating in sand. Shallow excavations will require appropriate shoring to prevent soil sloughing. If groundwater seepage can not be adequately controlled using pumps during concrete placement, placement of concrete using tremie methods may be required.

All test holes encountered dense to very dense sand throughout the explored depths. Due to these conditions; helical, driven concrete hex piles, and cast-in-place piles may not be suitable options, as achieving the required embedment depths may be difficult, necessitate full- depth sleeving, or may result in pile damage during installation.

Due to the proximity of the existing arena building and the potential for damage from excessive vibrations, driven steel pipe or H-piles as well as pre-cast concrete hex piles are not recommended. The dense to very dense sand encountered on the site may prevent displacement piles such as steel pipe or pre-cast concrete piles from reaching the target embedment depth and may result in damage to the piles.

Cobbles and boulders such as those found within area of the proposed north garage and ice plant extension location (northwest of the existing arena), must be removed if encountered during construction phase.

Dense to very dense sand is considered suitable for supporting foundations, parking lots, roadways or sidewalks. If soft or unsuitable soils (e.g., organics, silt, silty clay, or saturated clay) are encountered at the prepared subgrade elevation, these soils should be removed and replaced with compacted granular fill. Recommendation for subgrade preparation beneath mat slabs, soil supported floor slabs, and pavement structures are provided in this report.

5.0 FOUNDATION RECOMMENDATIONS

5.1 Limit States Design

The foundation considerations described in this report follow Limit State Design (LSD) guidelines. Limit State Design requires consideration of two (2) main loading states: Ultimate Limit State (ULS) and Serviceability Limit State (SLS). The ULS are primarily concerned with the collapse mechanisms of the structure and safety, and the SLS present conditions or mechanisms that restrict or constrain the intended use, function, or occupancy of the structure under expected service or working loads.

Design parameters listed in the following tables present the unfactored ULS design values and represent nominal (ultimate) geotechnical resistance, R_n. The appropriate geotechnical resistance factors (Φ) should be applied to determine the factored geotechnical resistance as presented in the following equation:

$$\Phi R_n \geq \Sigma \alpha_i S_{ni}$$

where:

Φ – geotechnical resistance factor

R_n – nominal (ultimate) geotechnical resistance

$\Sigma \alpha_i S_{ni}$ – summation of the factored overall load effects for a given load combination

The soil design parameters have been estimated based on the site investigation and correlations to engineering properties. The interpreted stratigraphy should be verified during the installation of the building foundations. KGS Group should be notified if conditions vary from what is described in this report so, if necessary, the foundation design can be modified based on the observed change of conditions.

5.2 Shallow Footings

KGS Group's structural department has informed the geotechnical department that the existing arena building is likely bearing on shallow footings at a depth of approximately 1.2 m (4 ft) BGS. To minimize the potential for differential settlement and adverse lateral soil pressures between the existing structure and the proposed additions, it is recommended that new footings be constructed of a similar size and at a similar embedment depth. Therefore, it is critical to the project that the dimensions and embedment depth of the existing foundations be confirmed. KGS Group should be notified if the existing building foundations differ from the assumptions listed above.

Based on our understanding of the existing building structure and the completed geotechnical investigation, shallow footings founded on very dense silty sand at a depth of 1.2 m BGS and provided with appropriate insulation may be used to support the proposed building additions at this site.

Ultimate Limit State (ULS) and Serviceability Limit State (SLS) design parameters have been developed for shallow footings bearing on very dense silty sand at a minimum embedment depth of 1.2 m BGS. Where foundations are constructed above the estimated depth of frost penetration (2.5 m BGS), frost protection measures such as rigid insulation may be required. Additional requirements are listed below for when shallow foundations are founded above the frost penetration depth.

Shallow foundations with a maximum pad size of 2 m x 2 m may be designed based on an SLS bearing pressure of 210 kPa and an unfactored ULS bearing pressure of 640 kPa. Strip footings with a maximum width of 0.75 m and length of 40 m may be designed based on an SLS bearing pressure of 155 kPa and an unfactored ULS bearing pressure of 470 kPa. A geotechnical resistance factor (ϕ) of 0.5 shall be applied to the unfactored ULS values to determine the factored geotechnical resistance. The recommended SLS bearing pressures are anticipated to limit total settlements to approximately 25 mm. Additional footing sizes and corresponding capacities can be provided by KGS Group upon request.

The following is recommended for the shallow footings:

- Pad or strip footings should be founded no shallower than 1.2 m below final exterior grade and should bear on the very dense silty sand and shall be provided with appropriate insulation. It is further recommended that all footings for existing and new structures be found at the same depth.
- Insulation should be comprised of a 100 mm (minimum) thick rigid synthetic material. Insulation should be installed at a minimum depth of 600 mm below the final exterior grade to protect from damage; extend outward laterally 2.4 m (minimum) beyond the perimeter of the structure; and also, be placed on the vertical face of the exterior footing, wall or grade beam. The surface of the insulation should slope downward away to promote positive drainage away from the structure. To avoid damage to the rigid insulation the first lift of fill immediately above the insulation should not contain particle sizes larger than 15 mm.
- KGS Group should be contacted if a significant amount of water seepage is observed at the time of installation to determine if a foundation subsurface drainage system is required.
- The very dense silty sand bearing surface for shallow footings must be confirmed by an experienced geotechnical professional trained in foundation inspections.
- As the sand encountered at the project site is frost suspectable, it is further recommended that the shallow foundations be provided with a perimeter subdrain and sump pump to control groundwater levels. Sum pump discharge should be directed to a surface drainage system located sufficiently away from the building to prevent recharge of the groundwater system. Dry subgrade soils will minimize the potential for frost heave. Additional subsurface drainage recommendations are provided in Section 9.4.
- Where topsoil, organics, soft silts or clays, fills or other unsuitable soils are encountered at the footing level, the unsuitable soils should be removed down to competent soil. Where additional excavation is required, the areas can be backfilled with compacted granular fill. In this case, excavations should extend laterally 600 mm (2 ft) beyond the footing edges.
- Where sub-excavation is required to remove soft or unsuitable materials the granular backfill should conform to Manitoba Infrastructure Specification No. 901(I) dated March 2020 for Granular Base Coarse (GBC-II) and should be submitted to KGS Group for approval prior to importing to site. If required, granular backfill beneath the footings should be placed in maximum 150 mm lifts and compacted to 98% Standard Proctor Maximum Dry Density (SPMDD) within 2% of the optimum moisture content.
- Granular fill placement should be monitored by qualified geotechnical personnel to ensure that the material supplied, and compaction criteria of the granular fill is achieved and is in accordance with the recommendations presented in this report.

6.0 INTERIOR SLABS

6.1 Slab-On-Grade

Interior floor slabs may consist of either a slab-on-grade or structural slab construction. A slab-on-grade should only be selected if some movement and cracking of the floor slab can be tolerated. Differential movements ranging from 25 to 50 mm are commonly observed for floor slabs supported at grade. If the potential for movement and cracking of the interior slab is unacceptable, the floor should be constructed as a structural slab. Under no circumstance should slab-on-grade construction take place during freezing conditions or on frozen ground or while frozen ground is thawing. The following recommendations should be considered for the support of an interior floor constructed as a slab-on-grade:

- Remove surficial topsoil, fill, organics, silt, and soft or unsuitable soils if encountered below slabs down to the native very dense sand. Proof rolling and compaction of the subgrade soil should be completed using a heavy roller under the supervision of an experienced geotechnical engineer to identify unsuitable or soft areas to achieve a minimum of 95% of the standard Proctor maximum dry density (SPMDD). If unsuitable subgrade soils such as organics, fill, silt or soft clay are encountered, they should be sub-excavated by an additional 600 mm and backfilled with compacted granular sub-base to 98% SPMDD.
- The contractor must protect the finished subgrade surface from excessive moisture during construction and promote runoff away from the subgrade.
- Site grading fill placed to raise the site to finished grade (i.e., fill placed above the existing ground surface) can consist of a sub-base granular fill if properly moisture conditioned to within 2% of optimum moisture content and compacted to 98% SPMDD.
- A minimum 150 mm of granular base over 300 mm of sub-base should be placed immediately below the floor slab. All granular fills should be placed in maximum 150 mm thick lifts and compacted to 98% SPMDD. A non-woven geotextile fabric should be placed as a separator between the prepared subgrade and compacted granular fill.
- The granular base course (GBC-II) and sub-base course (GSB-C) should be well graded and be free of organics and frozen material supplied in accordance with appliable standard specifications, such as Manitoba Infrastructure Specification No. 901(I) dated March 2020. Sieve analysis and compaction testing of the granular base and sub-base should be conducted by qualified geotechnical personnel to ensure that the materials supplied, and percent compactions are in accordance with design specifications.
- All mechanical services or piping that would be buried within the engineered fill should be designed to accommodate potential slab movement.

6.2 Structural Slabs

Where slab movements cannot be tolerated, structural floor slabs are recommended. Structural floor slabs are constructed over a minimum 150 mm void space to reduce the potential movement due to swelling or frost heave from the underlying soil.

7.0 SURFACING

7.1 Asphaltic and Gravel Pavement

It is understood that access roads and parking areas will be constructed as part of the site development for this project. Based on the soil conditions encountered in the test holes and subject to inspection by qualified geotechnical personnel, the parking areas and access roads may be designed based on the recommendations provided in Table 3 and Table 4. The asphalt or gravel surfaced sections are not based on actual traffic volume data, as this information was not available at the time this report was prepared. These are typical surfacing sections that can be reviewed along with the estimation of the anticipated vehicle types and frequencies.

TABLE 3: ASPHALTIC CONCRETE PAVEMENT SECTIONS

Material	Light Traffic Loading (mm)	Heavy Traffic Loading (mm)	Minimum Compaction Requirement
Asphaltic Concrete	50	100	98% Marshall
Base Course (GBC-II)	150	150	100% Standard Proctor (ASTM D698)
Sub-base (GSB-C)	350	450	100% Standard Proctor (ASTM D698)
Subgrade	• Proof-roll with smooth drum vibratory compactor. • Place non-woven geotextile over sub-grade materials.		

TABLE 4: GRAVEL SURFACING SECTION

Material	Light Traffic Loading (mm)	Heavy Traffic Loading (mm)	Minimum Compaction Requirement
Base Course (GBC-S)	150	200	100% Standard Proctor (ASTM D698)
Sub-base (GSB-C)	300	400	100% Standard Proctor (ASTM D698)
Subgrade	• Proof-roll with smooth drum vibratory compactor. • Place non-woven geotextile over sub-grade materials.		

Proof rolling and compaction of the subgrade should be completed using a smooth drum vibratory compactor under the supervision of an experienced geotechnical engineer to identify unsuitable or soft areas and achieve a minimum compaction of 95% SPMDD. If unsuitable subgrade soils such as organics, loose silt or soft clay are encountered, they should be sub-excavated and additional 300 mm and backfilled with compacted granular sub-base to 98% SPMDD. A non-woven geotextile fabric should be placed as a separator between the subgrade and compacted granular fill.

The granular base and sub-base should be well-graded and be free of organics and frozen material in accordance with appliable standard specifications, such as Manitoba Infrastructure Specification No. 901(I) dated March 2020. Sieve analysis and compaction testing of the granular base should be conducted by qualified geotechnical personnel to ensure that the materials supplied, and granular base compactions are in accordance with design specifications.

For the hot mix asphaltic concrete, sieve analysis of aggregates, compaction testing, and Marshall testing should be undertaken to confirm that the asphaltic concrete pavement complies with the project specifications.

Concrete apron pads are recommended for isolated areas where larger static wheel loads may exist, including the delivery/loading dock, re-surfacer, and garbage pick up areas. Exterior grade supported concrete pads (including sidewalks) will be subjected to seasonal vertical movements related to frost. Connection and tie-in details between the exterior concrete slabs and rigid structures element such as grade beams, pile caps or interior slabs should account for this potential frost jacking. To mitigate the frost heave movements, consideration should be given to the use of rigid synthetic insulation, extending outward laterally (minimum 1.8 m length and about 100 mm thick) and beneath the structure.

8.0 UTILITY INSTALLATIONS

8.1 Subgrade Preparation

Disturbance to trench subgrades should be minimized as much as possible to reduce the potential for post-construction differential movements. It is recommended that a flat-edged bucket be used to cut to final design grades. Additional recommendations can be provided during construction on a case-by-case basis if subgrades are highly disturbed and/or if soft/wet conditions are encountered. Subgrade stabilization techniques using large rock and/or geotextiles may be required as directed by KGS Group. Subgrades should not be allowed to freeze during construction and/or immediately prior to placing pipe bedding material. Vibratory features on compaction equipment should not be used in wet or unstable soil conditions. The minimum bedding thickness below watermain and sanitary sewer shall be 150 mm, and the granular material shall consist of a poorly graded gravel with a maximum grain size of 20 mm, having less than 5% passing the 75 µm sieve.

8.2 Backfill and Compaction

Utility pipe bedding and backfill shall be in accordance with Manitoba Infrastructure Specification No. 1004 M dated February 1982. Backfill and compaction around pipes should be performed simultaneously to minimize lateral shifting. Thoroughly place and compact bedding below pipe haunches or the zone between the pipe invert and the spring line. To accomplish backfilling, the distance between the side of the pipe at the spring line and the trench wall should be at least 300 mm.

KGS Group understands that utility excavations will be backfilled with granular fill. KGS Group recommend granular fill be well graded with a maximum aggregate size of 50 mm (2 in). Backfill shall be free of topsoil, roots, organics, oversized rocks, frozen or other deleterious materials. Backfill shall be placed in maximum 200 mm thick loose lifts and compacted to at least 95% SPMDD, within 2% of optimum moisture content. Lift thicknesses can be increased to 300 mm (12 in) provided density testing indicates that compaction is achieved for the full depth of each 300 mm lift. Heavy-wheeled compaction equipment should not be used within a distance of two (2) pipe diameters above the crown of the pipe.

8.3 Thermal Insulation

The depth of utility burial should be below the depth of frost penetration (minimum 2.5 m). Shallow buried utilities can be protected using closed cell extruded polystyrene (XPS) foam insulation. The amount and extent of insulation required will be dependent on several factors including the thermal regime around the pipe, the depth of burial, surface conditions, and fluid temperature, if present.

For shallow-buried utilities, it is recommended that horizontal insulation be installed to provide additional frost protection. This insulation should consist of HL-40 rigid foam panels, with a minimum thickness of 75 mm and a width of 2.0 m, placed horizontally above the pipe. A minimum of 1.2 m of backfill cover is assumed to be placed above the insulation.

To protect the insulation from mechanical damage during backfilling, the first lift of fill placed directly above the insulation should be free of particles larger than 15 mm.

9.0 ADDITIONAL DESIGN RECOMMENDATIONS

9.1 Frost Penetration

The depth of frost penetration will vary depending on air temperature, ground cover, the type of fill used during development and other factors. The expected depth of frost penetration has been estimated assuming a design freezing index of 2360°C days, taken as the coldest winter over a 10-year period. The estimated maximum depth of frost penetration is 2.5 m assuming bare ground and no insulation cover. The soil can heave upon freezing and must be considered in the foundation design. Good site drainage must also be maintained after development.

Well graded granular materials should be used as structural backfill as they are less susceptible to the effects of frost heave than fine-grained silt and clay soil. Polystyrene insulation can be used as a thermal insulator to minimize any effects that frost could potentially have on foundations or slabs.

Soil in contact with foundation elements can freeze to the foundations and develop adfreeze bonding, which can result in uplift forces. The 5th Edition of the Canadian Foundation Engineering Manual (CFEM 2023) recommends the following adfreeze bond stresses for soil and foundation materials:

- 65 kPa for fine-grained soils frozen to wood or concrete;
- 100 kPa for fine-grained soils frozen to steel; and
- 150 kPa for saturated gravel frozen to steel.

The adfreeze bond stresses listed above should be considered for foundation elements exposed to frost beneath non-heated structures.

9.2 Insulation for Existing Arena Floor Slab

It is understood that there is concern that formation of ice within the existing arena will result in frozen ground conditions below and adjacent to the building. Best construction practice would be to install insulation beneath the floor slab to prevent the propagation of frost into the underlying soil. It is recommended that as built drawings of the existing arena building be reviewed to determine if insulation was provided beneath the floor slab at the time of construction. Alternatively, a core of the concrete floor slab could be removed, or a small test pit could potentially be dug near the edge of the slab to confirm the presence of insulation beneath the existing floor slab.

During the drilling program KGS Group monitored the temperature of the upper soils within test holes TH26-06 and TH26-07 which were drilled adjacent to the existing building. The surface of the drilling areas was snow covered at the time of investigation. The temperatures recorded are presented on the test hole logs in Appendix B. Frozen soils to a depth of 0.3 m were recorded in TH26-06, all other readings below 0.3 m BSG remained above 0°C. Given the time of year and density of the underling sand materials it is expected that friction generated by the augers may have affected these readings, and the presence of insulation beneath the floor slab cannot be confirmed by this exercise.

If the exiting arena building is found on continuous strip footings the exterior footing wall or grade beam could be exposed and rigid insulation applied to the exposed surface. Insulation should be comprised of a 100 mm (minimum) thick rigid synthetic material. Insulation should be installed at a minimum depth of 1.0 m

below the final exterior grade to protect from damage; extend outward laterally 2.4 m (minimum) beyond the perimeter of the structure; and also, be placed on the vertical face of the exterior footing, wall or grade beam. The surface of the insulation should slope downward to promote positive drainage away from the structure. To avoid damage to the rigid insulation the first lift of fill immediately above the insulation should not contain particle sizes larger than 15 mm.

The method suggested above will not be suitable if the existing arena building is founded on individual pad footings, as sloughing of the sand and undermining of the existing floor slab will be anticipated. If the existing arena building is supported with individual pad footings the owner should reach out to a specialty insulation company to discuss potential remedial options.

9.3 Cement Type for Foundation Concrete

It is recommended that all foundation concrete in contact with soil be made with medium-resistant sulphate cement (MS). A maximum water to cement ratio of 0.5 should be specified in accordance with Table 2, CSA A23.1-04 for concrete with moderate sulphate exposure (S-3). Concrete which may be exposed to freezing and thawing should be adequately air entrained to improve freeze-thaw durability in accordance with Table 4, CSA A23.1-04.

9.4 Subsurface and Surface Drainage

A permanent subdrain system should be installed around the exterior of below grade walls. Subdrains should be constructed with a perforated weeping tile wrapped with a filter sock and backfilled with drain rock (clean pea gravel or clean crushed rock), placed in a trench directing flows to a central sump pit. Installation of subsurface drainage should be in accordance with locally accepted practices.

The final ground elevation around the perimeter of the structures should be sloped a minimum 2% to promote positive drainage away from the perimeter of all structures and to protect against surface water ponding. Roadways, parking lots, unloading areas and landscaping within a zone of approximately 2 m of the exterior perimeter of any structure should be sloped at a minimum gradient of 5% to compensate for future loss of grade that may result from potential settlement. Downspouts should be positively directed away from structures and beyond the backfill zone.

9.5 Temporary Excavations

All trenching and excavations should conform to the latest version of Manitoba Occupational Health and Safety Regulations (OH&S). A side slope of 1H:1V can be used for all excavations that have a maximum depth of 1.5 m. Excavations deeper than 1.5 m should be reviewed and designed prior to construction by an experienced professional engineer with an expertise in geotechnical engineering.

To maintain safe working conditions and a stable base for construction, water should not be allowed to accumulate within the excavation. A dewatering system consisting of a series of perimeter trenches and sump pumps located at the base of the excavation can likely control the seepage by pumping the water out of the excavation and discharging away from the limits of construction. The rate of seepage is expected to decrease as pumping operations continue.

Open excavation side slopes should be covered to prevent from drying or saturation and surface runoff should be directed away from excavations. Surcharge loads such as soil stockpiles, equipment, etc. should be kept a minimum of 1 m or a distance equal to the depth of excavation away from the edge of excavation, whichever is greater.

If a deep excavation with a shoring system is considered, KGS Group recommends that an excavation and shoring plan should be prepared and submitted by a registered Professional Engineer who is skilled in these designs.

9.6 Seismic Site Classification

In accordance with the 2020 National Building Code of Canada (NBCC), the site designation, X, is determined using the average shear wave velocity, V_{s30}, calculated from in-situ measurements. Where in-situ measurements are not available, the site designation shall be X_S, where S is the Site Class determined based on the average properties of soil and rock in the top 30 m. In reference to Table 4.1.8.4.-B and based on the results of the 2026 geotechnical investigation, the building's area Class may be C; therefore, the site designation is X_C.

Additional site testing, consisting of geophysical techniques (e.g., shear wave velocity sounding(s) by seismic methods), will allow for more accurate determination of seismic Site Class and Site Designation.

9.7 Earth Pressure Coefficients

The following active, passive and at-rest lateral earth pressure coefficients listed below in Table 5 may be used in the design of below grade walls or excavation shoring.

TABLE 5: EARTH PRESSURE COEFFICIENTS

Material	Unit Weight (kN/m^3)	ϕ'	K_a	K_p	K_o
Silty Sand (SM)	18	28°	0.361	2.770	0.531
Poorly Graded Sand with Silt (SP-SM)	18	28°	0.361	2.770	0.531
Well Graded Sand with Silt (SW-SM)	20.0	30°	0.333	3.000	0.500
Compacted Granular A Base Course (GW)	20.0	35°	0.271	3.690	0.426

Live loads or surface surcharge loads should be included if a significant loading is applied within a distance equal to the height of the below grade wall.

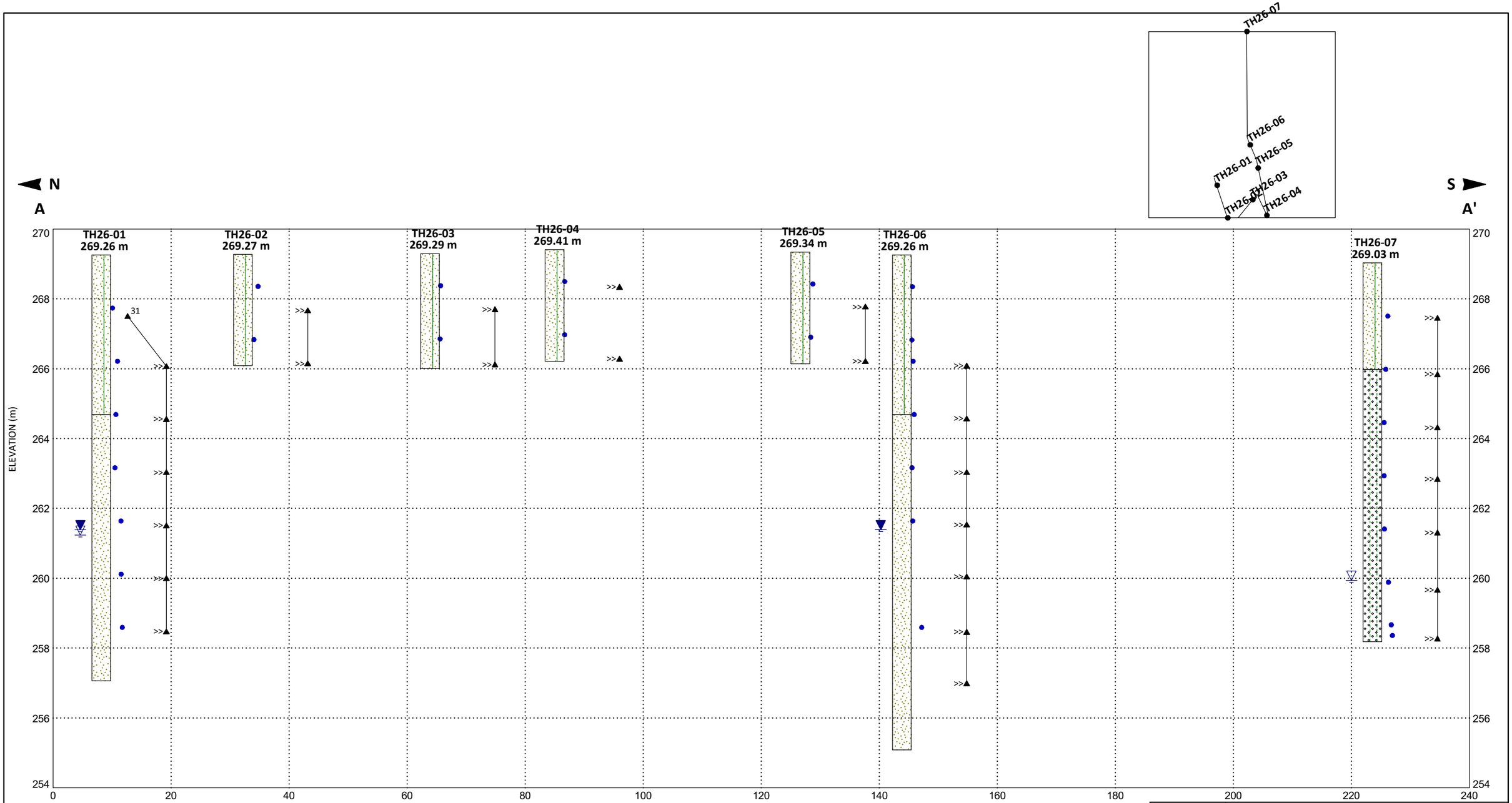
9.8 Construction Inspection

KGS Group should be retained to complete the following inspection services during construction:

- Detailed construction records and full-time inspection by experienced geotechnical personnel are recommended throughout the construction of foundations to ensure that the design capacities indicated in this report are achieved. Inspection of pile installation by experienced geotechnical personnel is required to ensure that the specified embedment depths are achieved and will allow for KGS Group to make changes if the soil types encountered at the time of installation are not consistent with those presented within this report.
- Observe subgrade proof roll below slabs-on-grade, exterior slabs, and pavement sections. Proof rolling inspection by an experienced geotechnical engineer is required to identify unsuitable or soft areas which will need to be sub-excavated and replaced with compacted granular fill.
- Sieve testing of granular base and sub-base to ensure that the supplied meet the graduation requirements.
- Compaction testing of subgrade and granular base and sub-base should be completed to ensure materials are compacted properly and meet the minimum compaction requirements specified for this project.

FIGURES

Fence Diagram – Cross-Section A-A’



Lithology Graphics

0 13
Horizontal Scale (meters)
Vertical Exaggeration: 6x

- Silty Sand (SM)
- Poorly Graded Sand (SP)
- Well Graded Sand with Silt (SW)

Legend

TH26-01 — Test Hole ID
Test Hole Lithology

- Water Level During Drilling
- Water Level Upon Completion
- Water Level Static/Remeasured
- SPT, N-Value
- DCPT Value
- > > values greater than 100
- Torvane Cu (kPa)
- Moisture Content (%)

KGS GROUP

RM OF HANOVER

Grunthal Arena Expansion - Geotechnical Services

A-A'

Mar 2026

Figure 01

FENCE W/O WELL DATA PLOT U:\FMS\26-0604-001\26-0604-001 GRUNTHAL ARENA - GEOTECHNICAL INVESTIGATION - FEBRUARY 2026.GPJ

APPENDIX A

Preliminary Architectural Drawings

HOME OF THE REDWINGS
GRUNTHAL ARENA

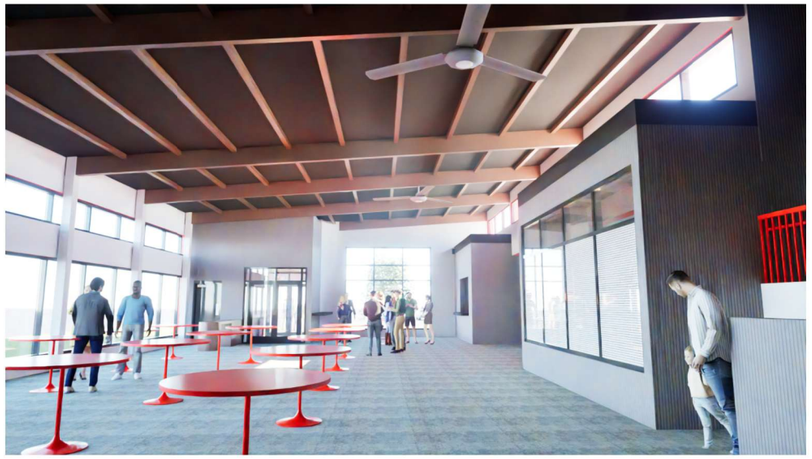
GRUNTHAL ARENA

HOME OF THE REDWINGS
GRUNTHAL ARENA

GRUNTHAL ARENA

A

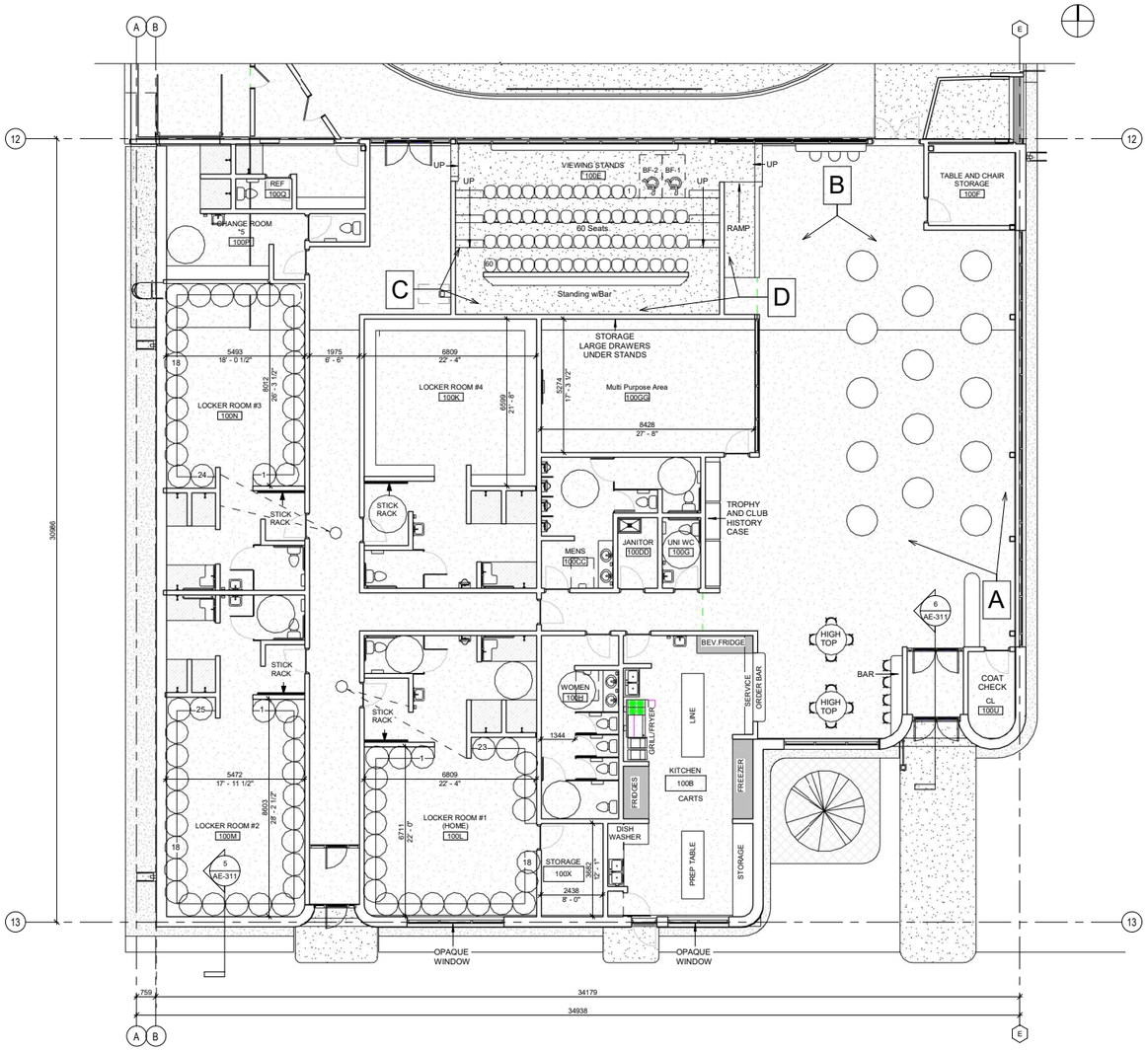
B



C

D

E



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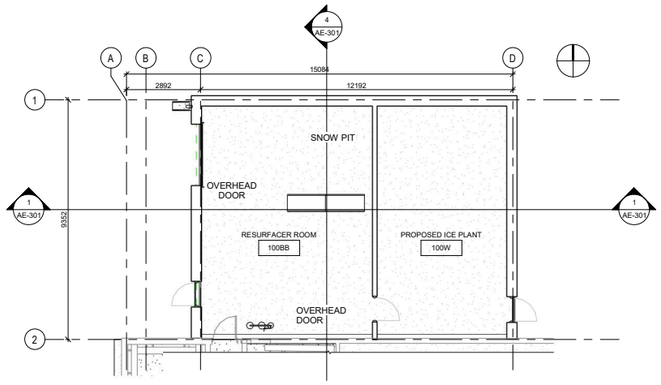
22

PROPOSED FLOOR PLAN

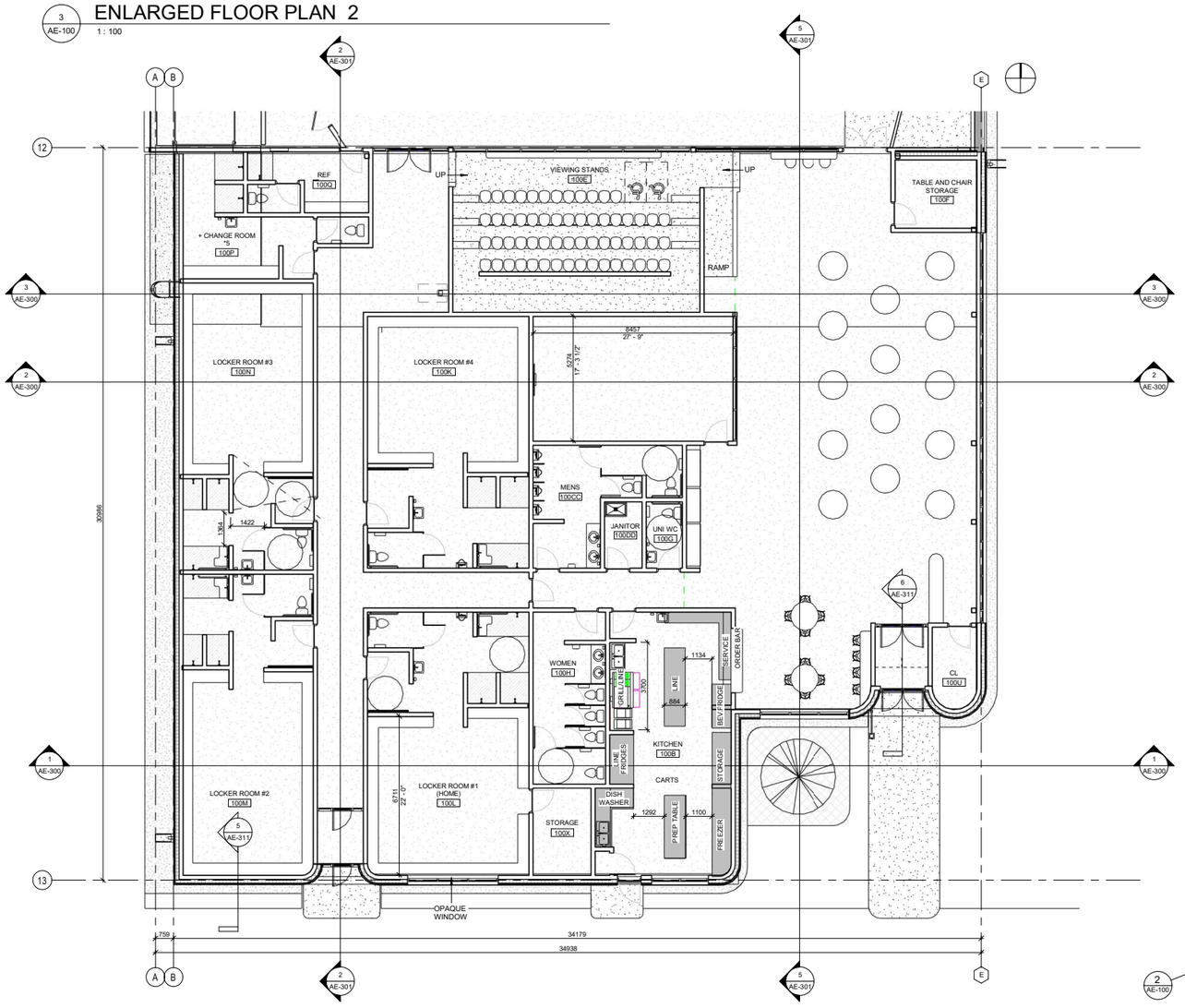
1 : 100



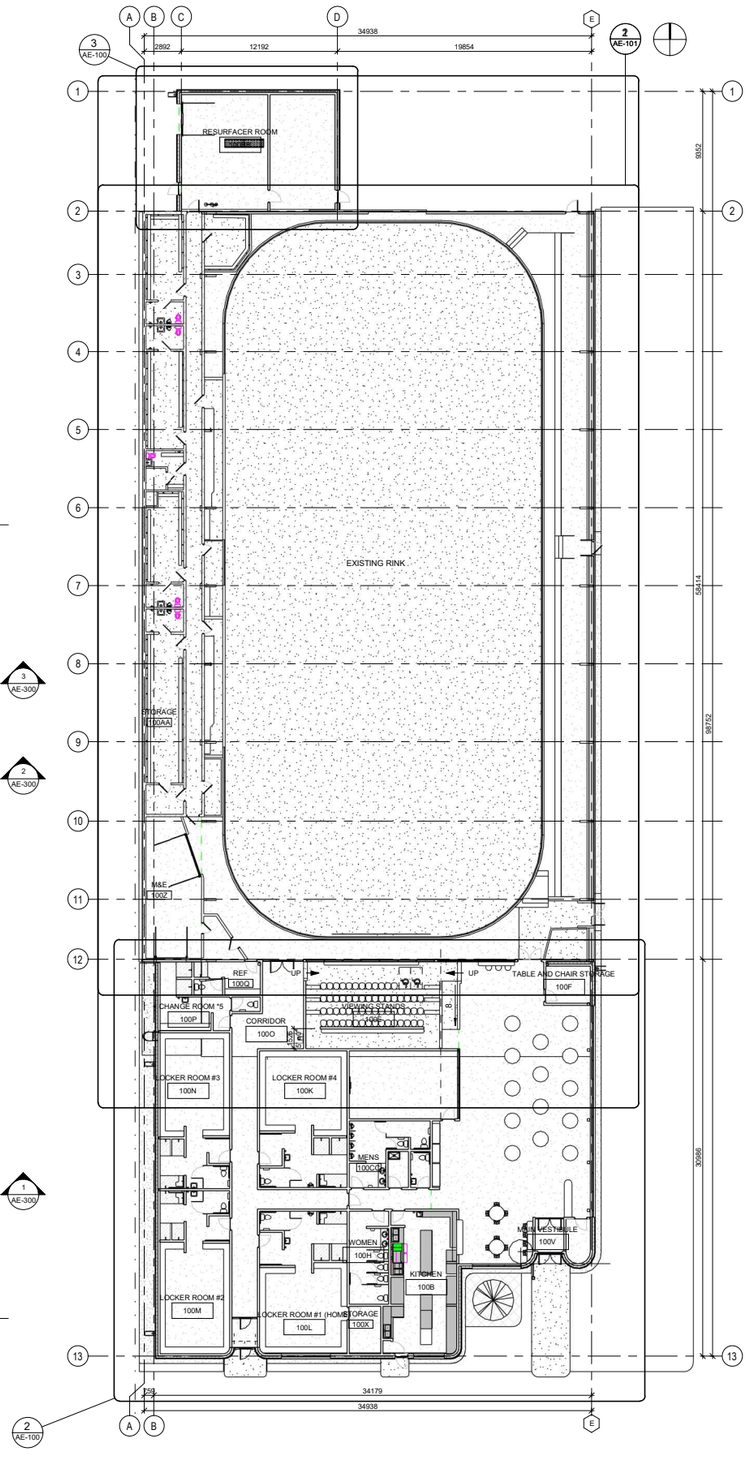
3 AE-100 ENLARGED FLOOR PLAN 2
1 : 100

01 - Area Schedule (Gross Building)

Name	Area
EXISTING ARENA	2061 m²
PROPOSED NORTH GARAGE AND ICE PLANT EXTENTION	117 m²
PROPOSED SOUTHERN EXTENSION	988 m²



2 AE-100 ENLARGED FLOOR PLAN 1
1 : 100



1 AE-100 LEVEL 100
1 : 200

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CONSULTANTS

NOTES

REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

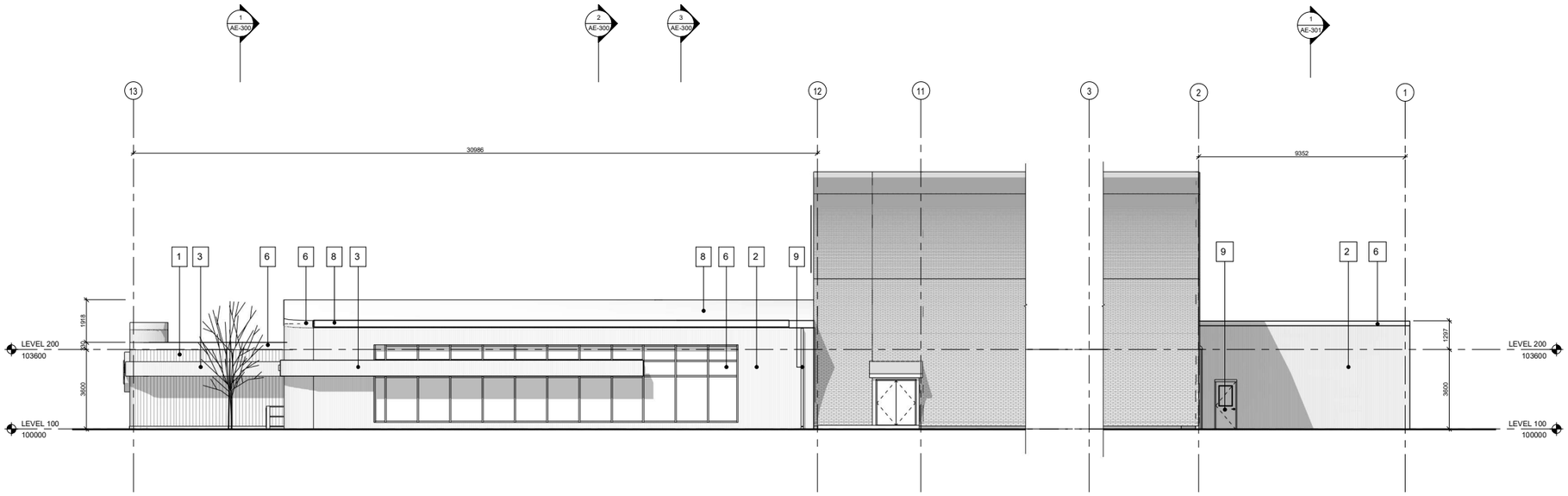
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
LEVEL 100 FLOOR PLAN EXPANSION

SCALE As indicated
PROJECT NUMBER 2024.01200
DRAWN BY Author

AE-100



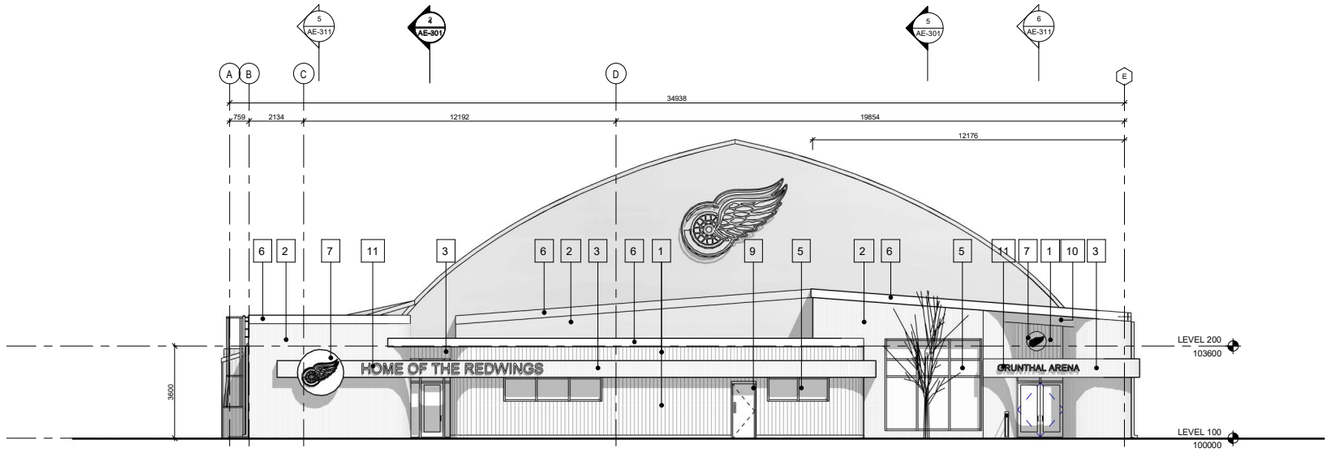
2 AE-200

EAST ELEVATION

1 : 100

EXTERIOR MATERIAL LEGEND

1	METAL PANEL - METALIC WHITE 4-6" FLAT PROFILE
2	METAL PANEL - ASH GREY 1/2" CORRUGATED PROFILE
3	METAL PANEL - CHARCOAL BOX RIB PROFILE
4	METAL PANEL - CHARCOAL 2" FLUTED PROFILE
5	FIBERGLASS WINDOW - BLACK RED JAM, SILL
6	PREFINISHED METAL ROOF FASCIA SYSTEM - SATIN BLACK
7	REDWINGS SIGNAGE - RED & WHITE
8	STANDING SEAM LOW SLOPE METAL ROOF
9	METAL DOOR PAINTED SATIN BLACK
10	EXTERIOR GRADE GLU-LAM TIMBER
11	EXTRUDED LETTER - RED



1 AE-200

SOUTH ELEVATION

1 : 100

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PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

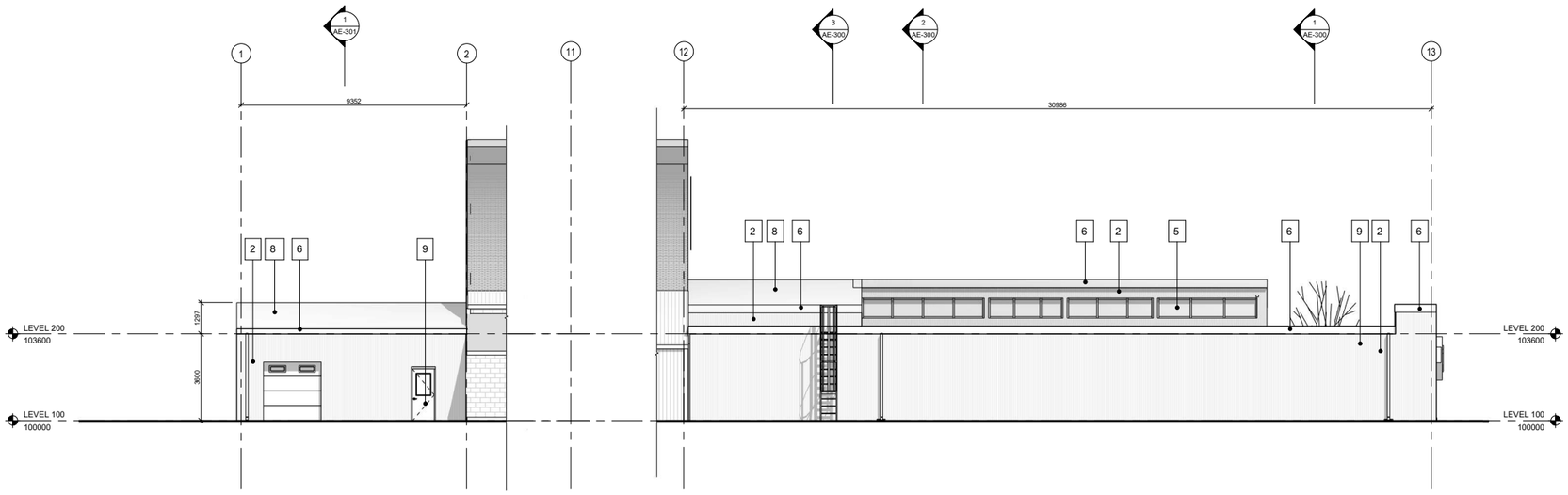
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
EXTERIOR ELEVATIONS

SCALE	1 : 100
PROJECT NUMBER	2024.01200
DRAWN BY	Author

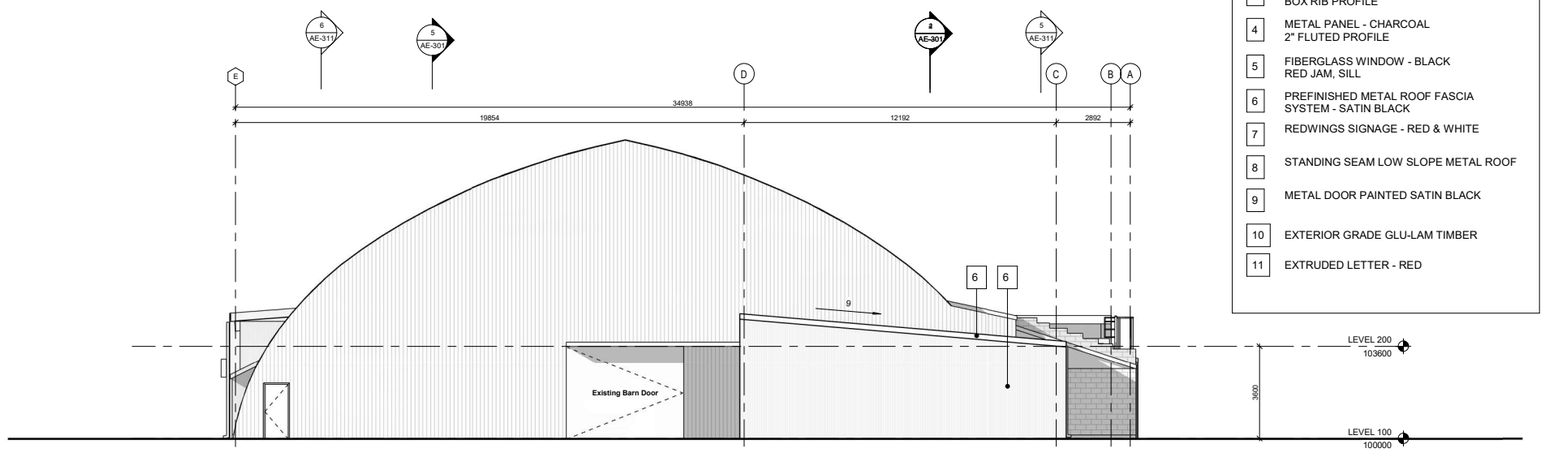
AE-200



2 AE-201

WEST ELEVATION

1 : 100



1 AE-201

NORTH ELEVATION

1 : 100

EXTERIOR MATERIAL LEGEND

1	METAL PANEL - METALIC WHITE 4-6" FLAT PROFILE
2	METAL PANEL - ASH GREY 1/2" CORRUGATED PROFILE
3	METAL PANEL - CHARCOAL BOX RIB PROFILE
4	METAL PANEL - CHARCOAL 2" FLUTED PROFILE
5	FIBERGLASS WINDOW - BLACK RED JAM, SILL
6	PREFINISHED METAL ROOF FASCIA SYSTEM - SATIN BLACK
7	REDWINGS SIGNAGE - RED & WHITE
8	STANDING SEAM LOW SLOPE METAL ROOF
9	METAL DOOR PAINTED SATIN BLACK
10	EXTERIOR GRADE GLU-LAM TIMBER
11	EXTRUDED LETTER - RED

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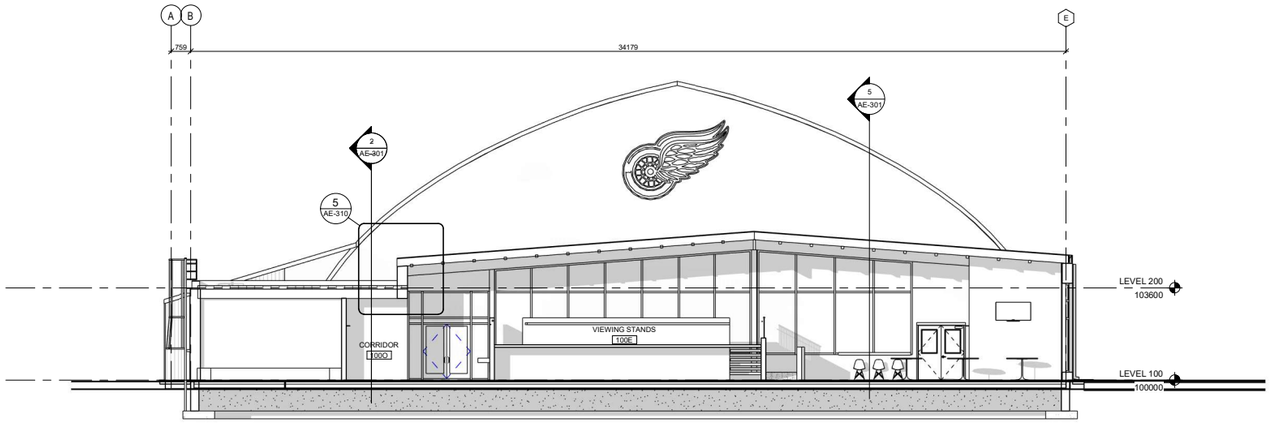
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
EXTERIOR ELEVATIONS 2

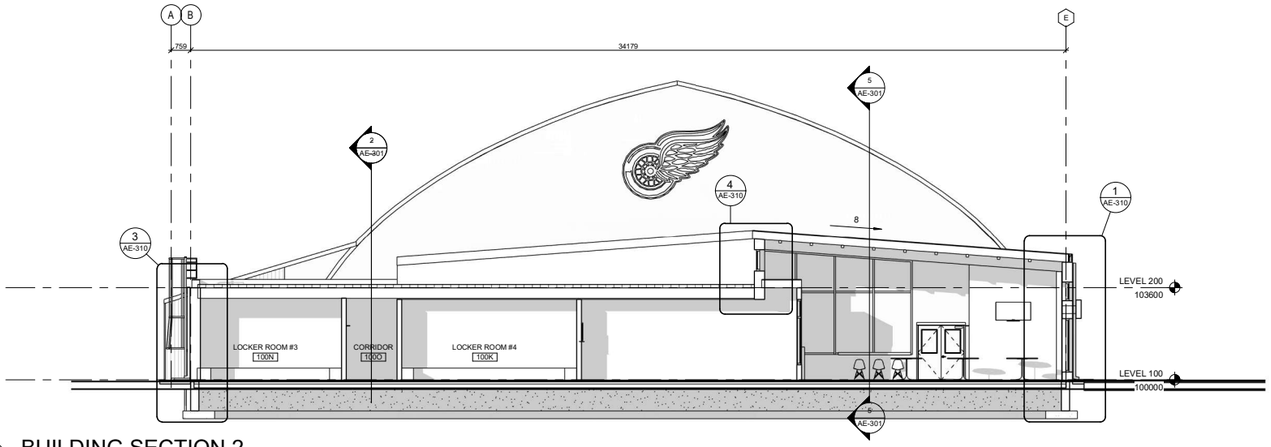
SCALE	1 : 100
PROJECT NUMBER	2024.01200
DRAWN BY	Author

AE-201



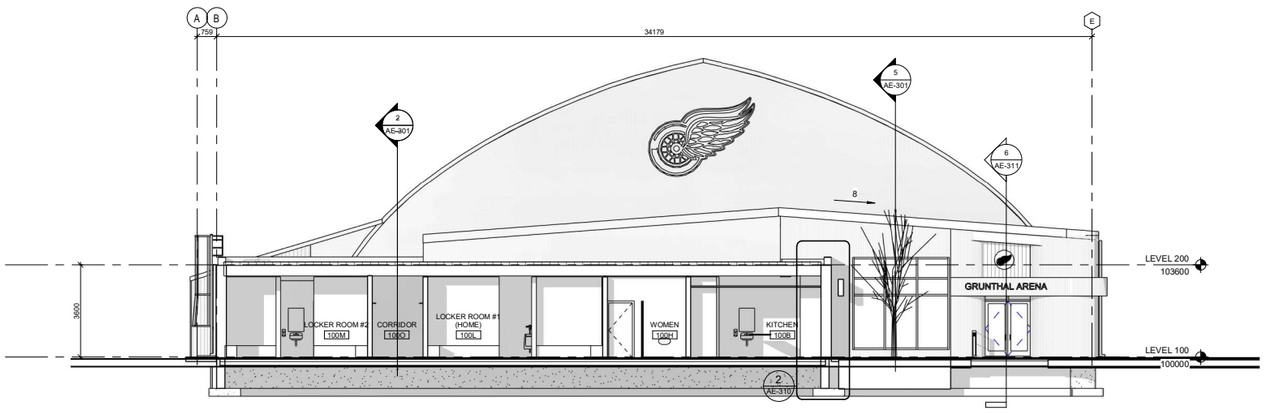
3 AE-300 BUILDING SECTION 3

1 : 100



2 AE-300 BUILDING SECTION 2

1 : 100



1 AE-300 BUILDING SECTION 1

1 : 100

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PRELIMINARY
NOT FOR CONSTRUCTION

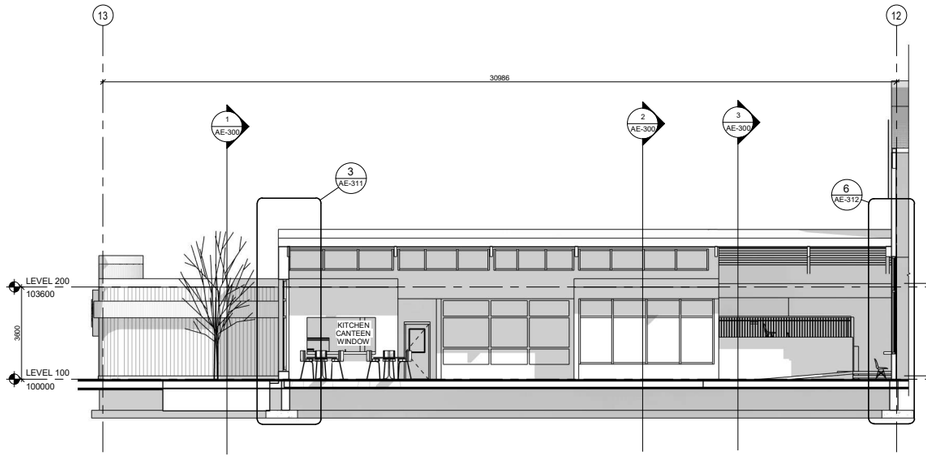
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

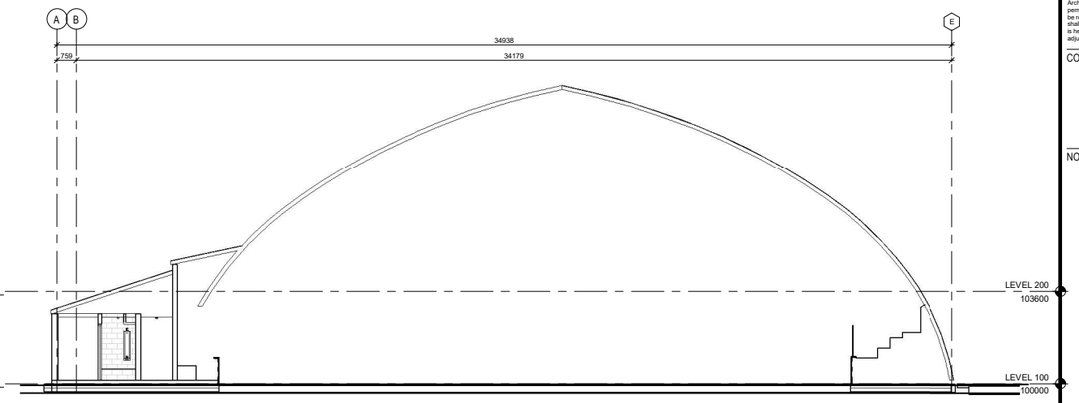
TITLE
BUILDING SECTIONS

SCALE	1 : 100
PROJECT NUMBER	2024.01200
DRAWN BY	Author

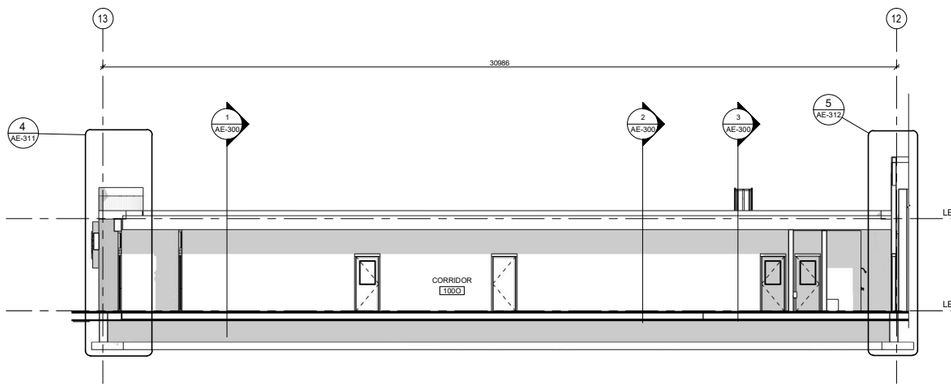
AE-300



5 AE-301 Section 7
1 : 100



3 AE-301 BUILDING SECTION 6
1 : 100



2 AE-301 BUILDING SECTION 5
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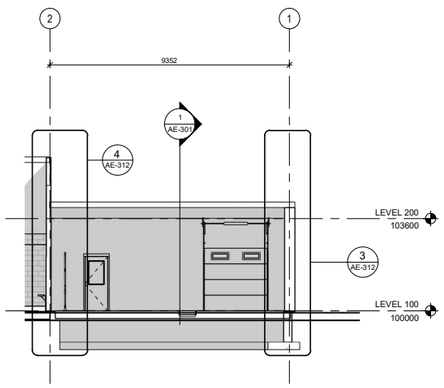

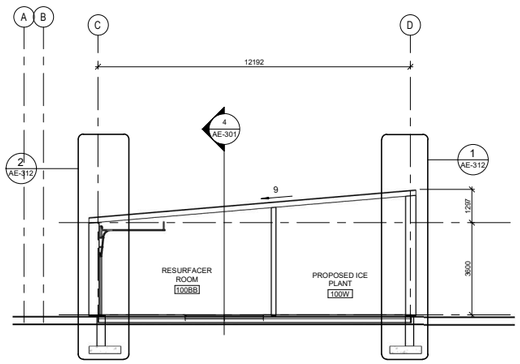

1 AE-301 BUILDING SECTION 4
1 : 100

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CONSULTANTS

NOTES

REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

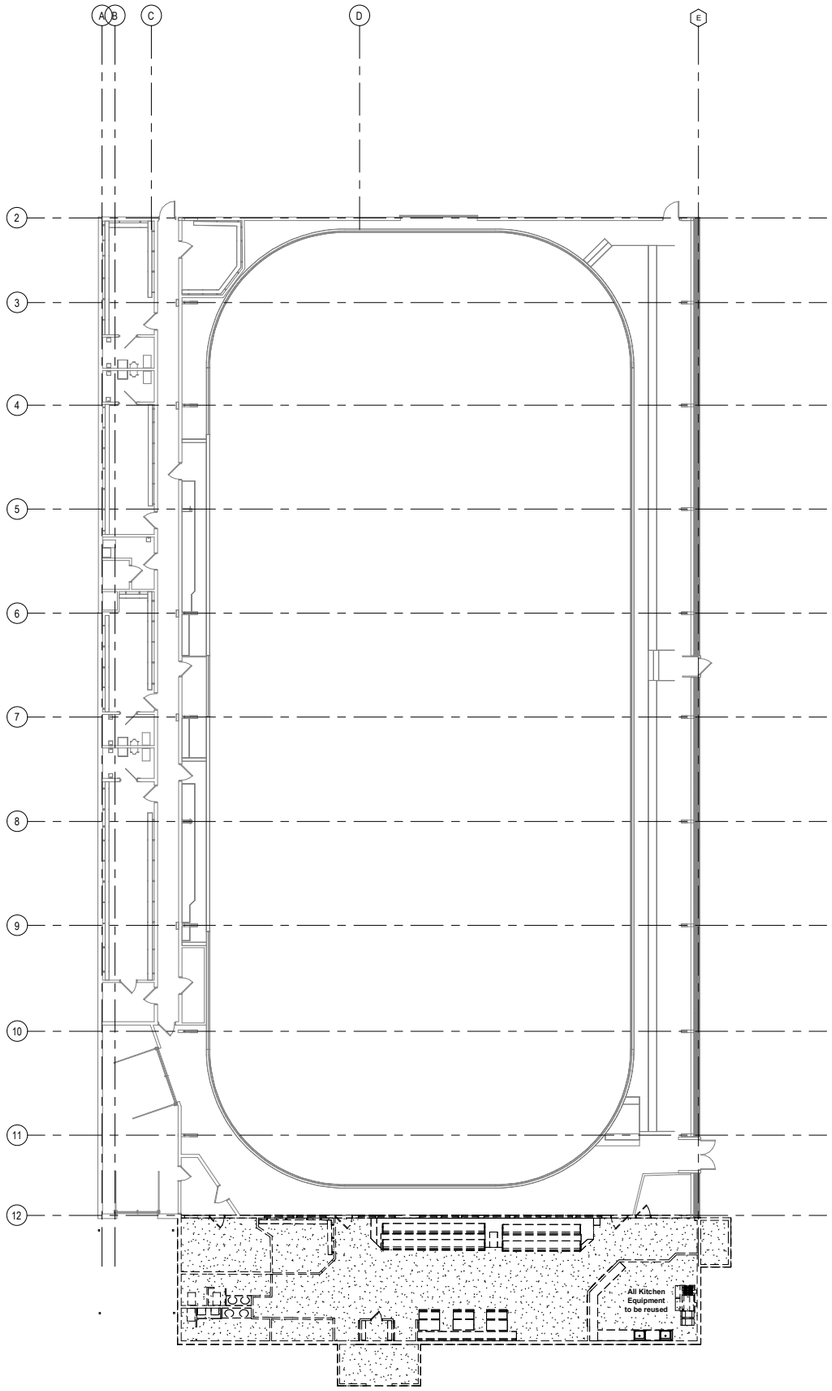
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

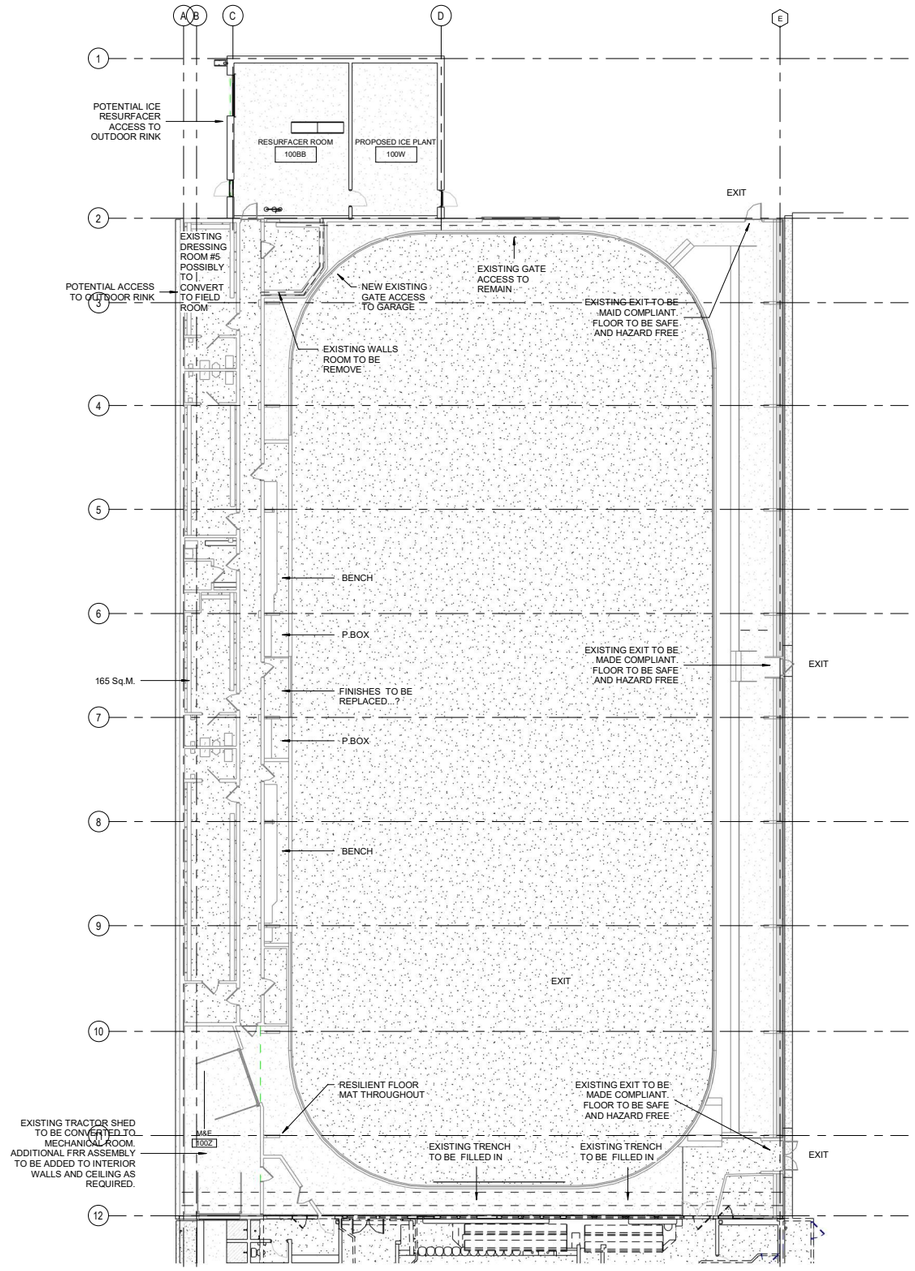
TITLE
BUILDING SECTIONS 2

SCALE	1 : 100
PROJECT NUMBER	2024.01200
DRAWN BY	Author

AE-301



2 AE-101 EXISTING FLOOR DEMOLITION PLAN
1 : 150



1 AE-101 EXISTING FLOOR PLAN REMEDIATION PLAN
1 : 150

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PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
LEVEL 100 FLOOR PLAN REMEDIAL

SCALE	1 : 150
PROJECT NUMBER	2024.01200
DRAWN BY	Author

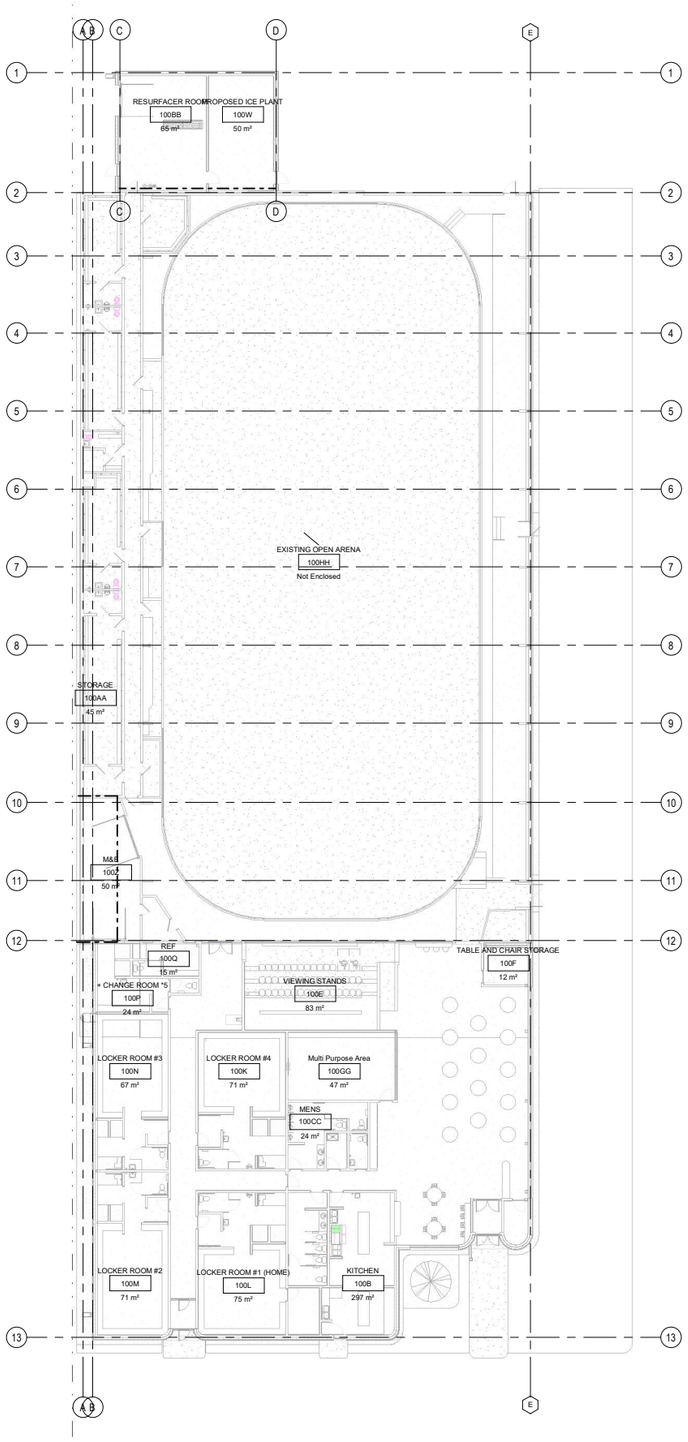
AE-101

01 - Area Schedule (Gross Building)

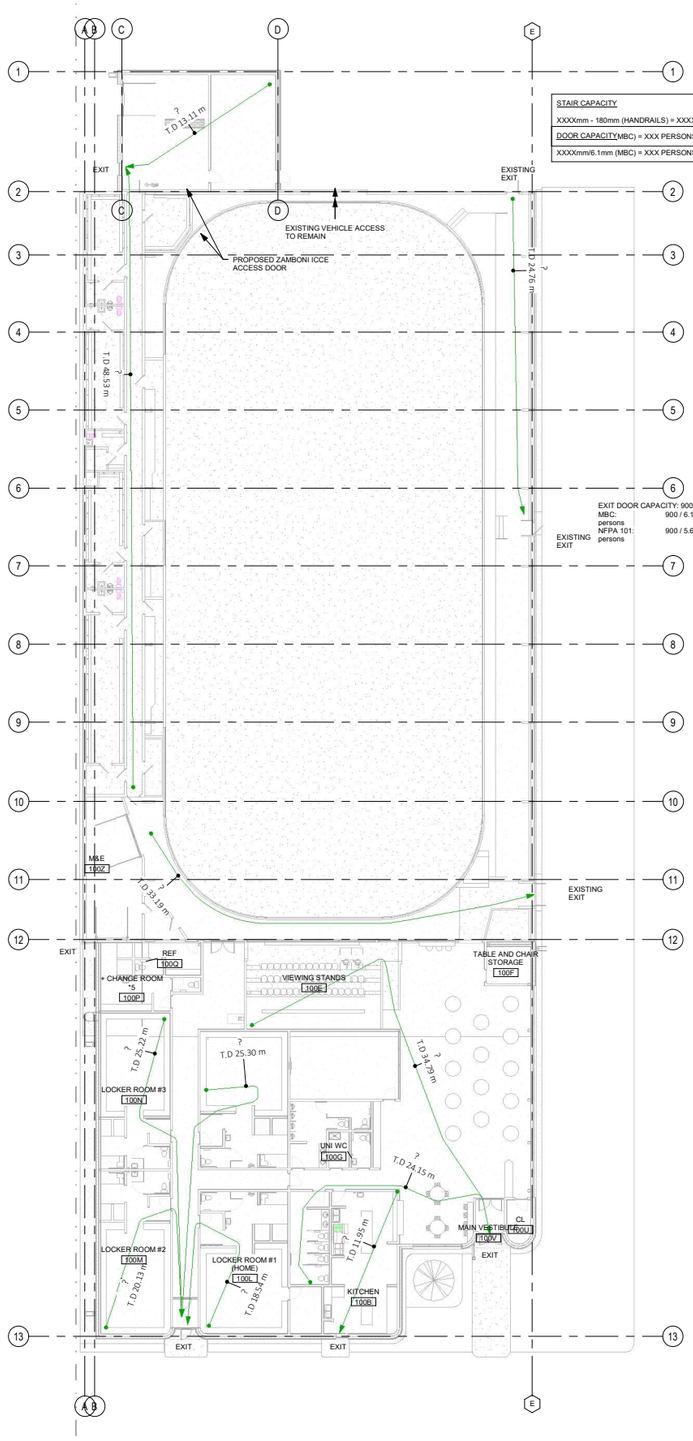
Name	Area
EXISTING ARENA	2061 m²
PROPOSED NORTH GARAGE AND ICE PLANT EXTENTION	117 m²
PROPOSED SOUTHERN EXTENSION	988 m²

LIFE SAFETY LEGEND

- XXX — DISTRIBUTION OF OCCUPANT
- XXX — DOOR CAPACITY
- XXX — STAIR CAPACITY
- XX — OCCUPANT LOAD
- PATH OF TRAVEL
- HATCH INDICATES WALLS WITH A 0 HOUR SMOKE SEPERATION
- HATCH INDICATES WALLS WITH A 3/4 HOUR FIRE RATING
- HATCH INDICATES WALLS WITH A 1 HOUR FIRE RATING
- HATCH INDICATES WALLS WITH A 1.5 HOUR FIRE RATING
- HATCH INDICATES WALLS WITH A 2.0 HOUR FIRE RATING



2 AC-100 LEVEL 100 - LS Copy 1
1 : 200



1 AC-100 LEVEL 100 - EXITS
1 : 200

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PROJECT NORTH

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PRELIMINARY
NOT FOR CONSTRUCTION

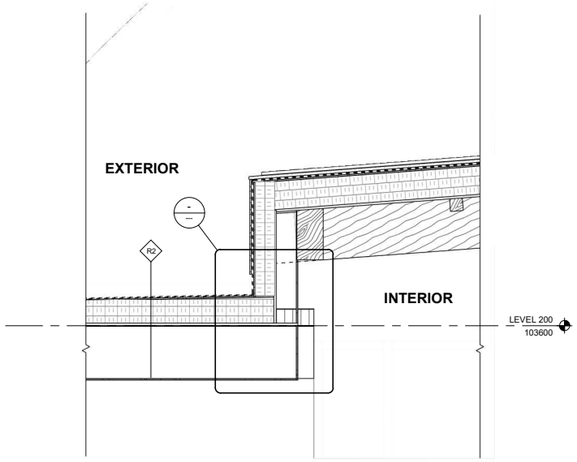
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

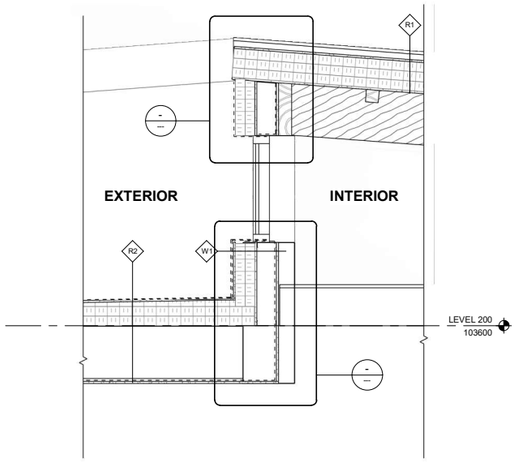
TITLE
LEVEL 100 FLOOR PLAN - LIFE SAFETY PLAN

SCALE As indicated
PROJECT NUMBER 2024.01200
DRAWN BY Author

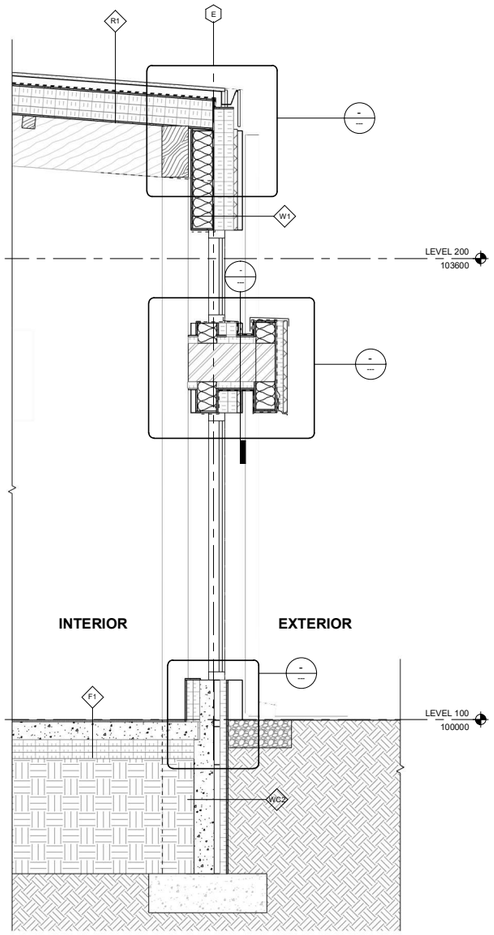
AC-100



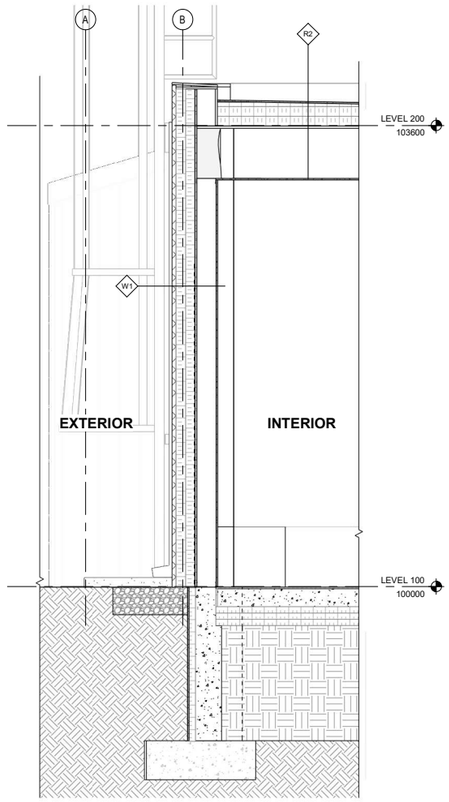
5 AE-310 INTER-ROOF DETAIL
1 : 20



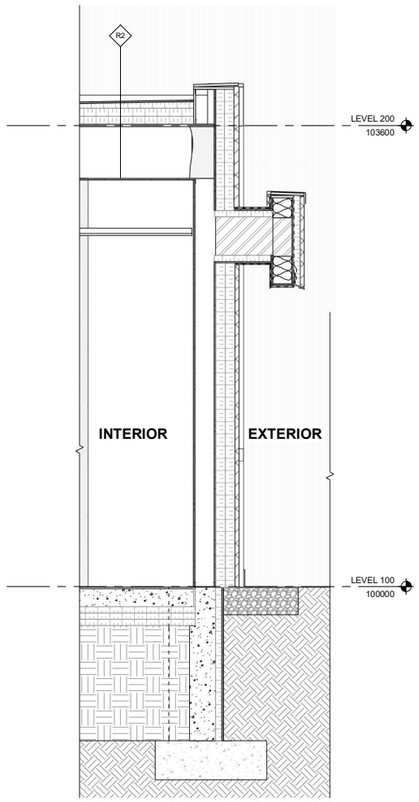
4 AE-310 CLEAR STOREY WINDOW
1 : 20



1 AE-310 TYP. EXTERIOR WALL SLOPE ROOF
1 : 20



3 AE-310 TYP. EXT WALL W/FLAT ROOF
1 : 20



2 AE-310 EXT.WALL W/CANOPY
1 : 20

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REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

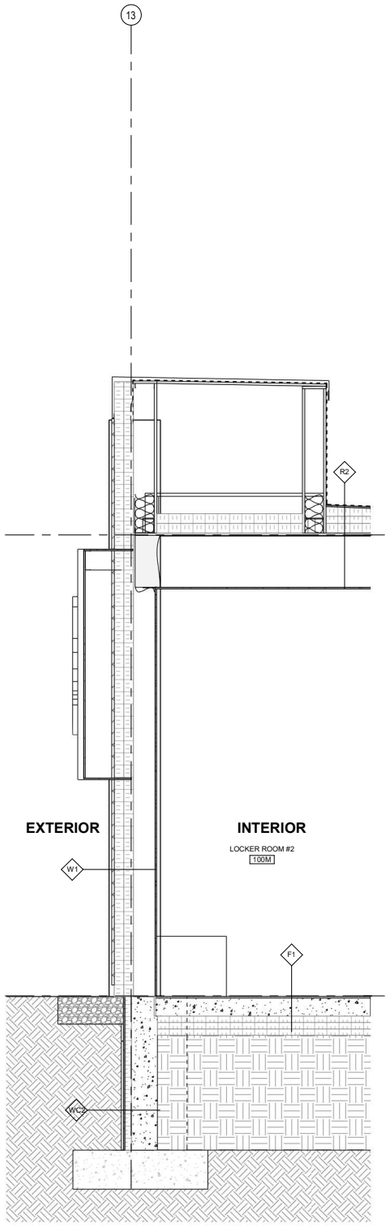
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

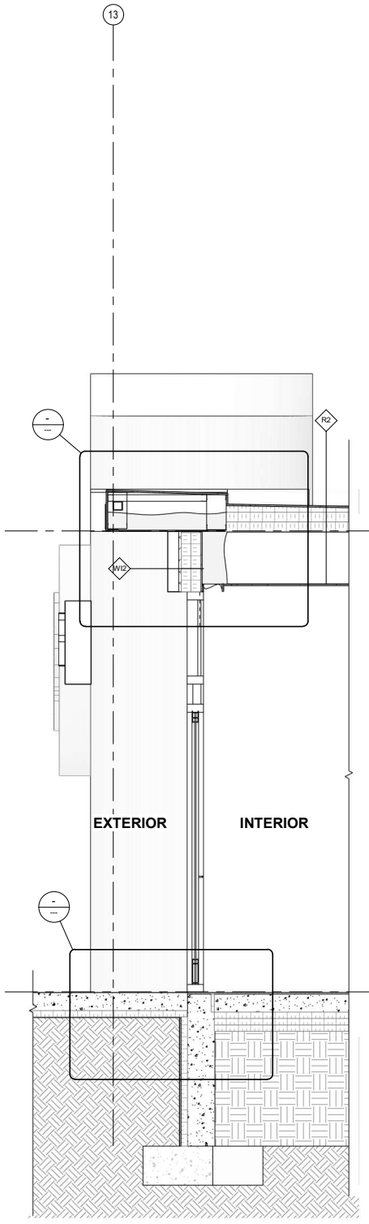
TITLE
WALL SECTIONS

SCALE	1 : 20
PROJECT NUMBER	2024.01200
DRAWN BY	Author

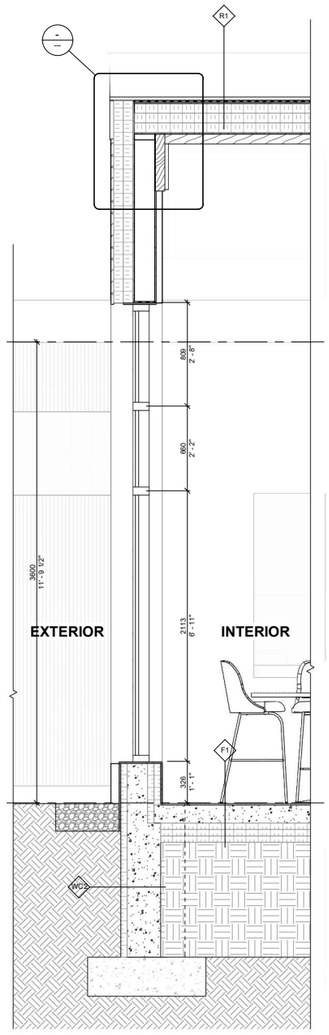
AE-310



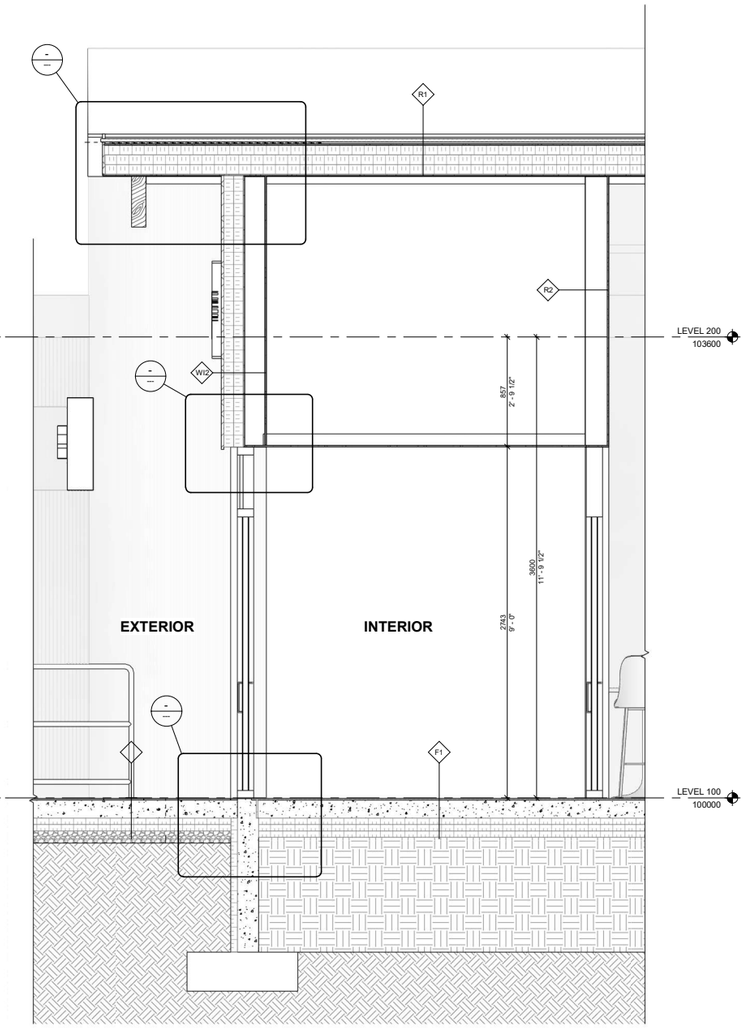
5 AE-311 SOUTH WALL CHANGE ROOM
1 : 20



4 AE-311 PLAYER ENTRANCE SECTION
1 : 20



3 AE-311 SOUTH WALL FOYER
1 : 20



6 AE-311 MAIN ENTRANCE SECTION
1 : 20

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PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

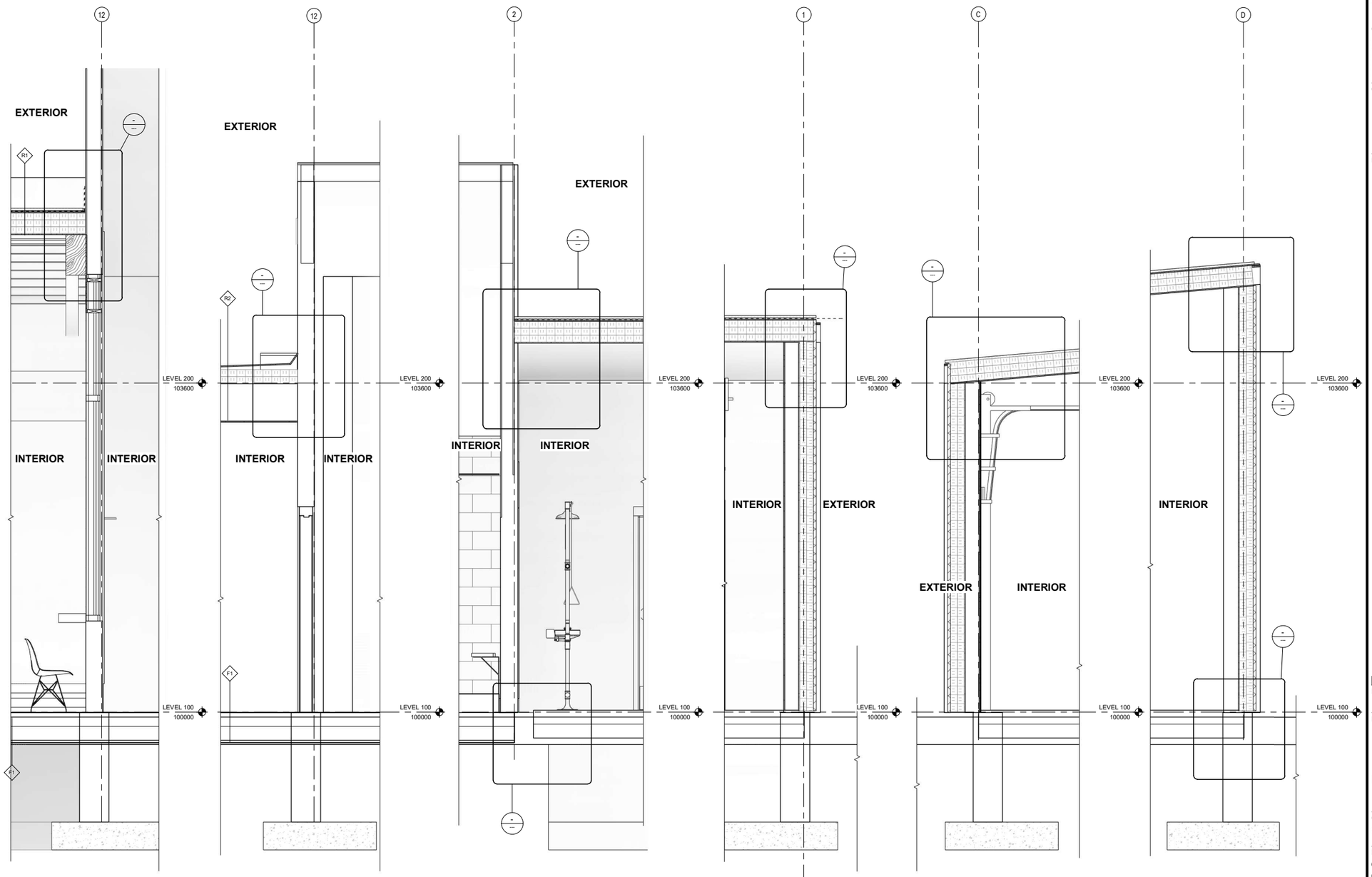
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
WALL SECTIONS 2

SCALE	1 : 20
PROJECT NUMBER	2024.01200
DRAWN BY	Author

AE-311



6 AE-312 R1 - ARENA WALL 1 : 20

5 AE-312 R2 - ARENA WALL 1 : 20

4 AE-312 GARAGE SOUTH WALL-ARENA 1 : 20

3 AE-312 GARAGE NORTH WALL 1 : 20

2 AE-312 GARAGE WEST WALL 1 : 20

1 AE-312 GARAGE EAST WALL 1 : 20

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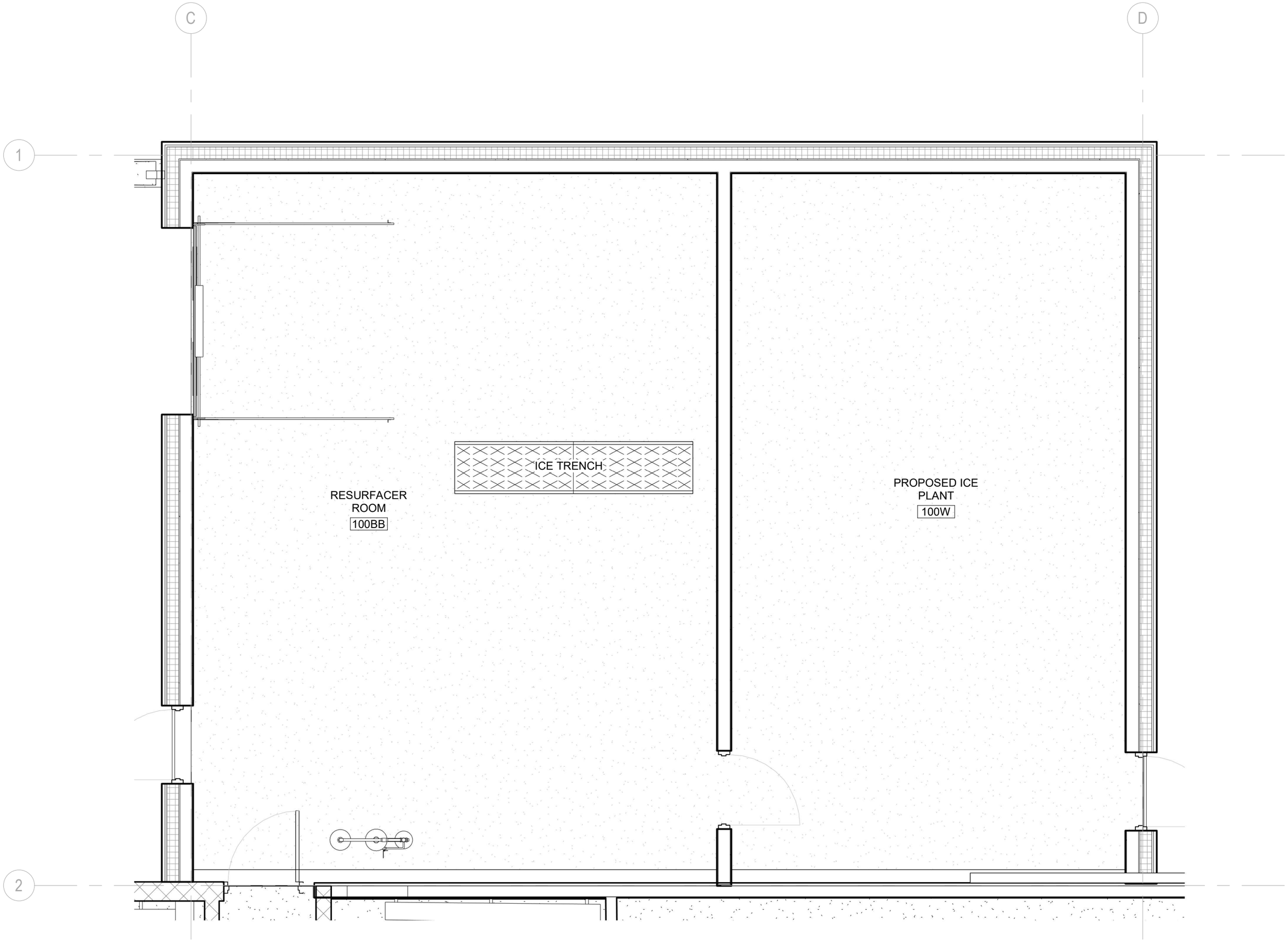
Owner

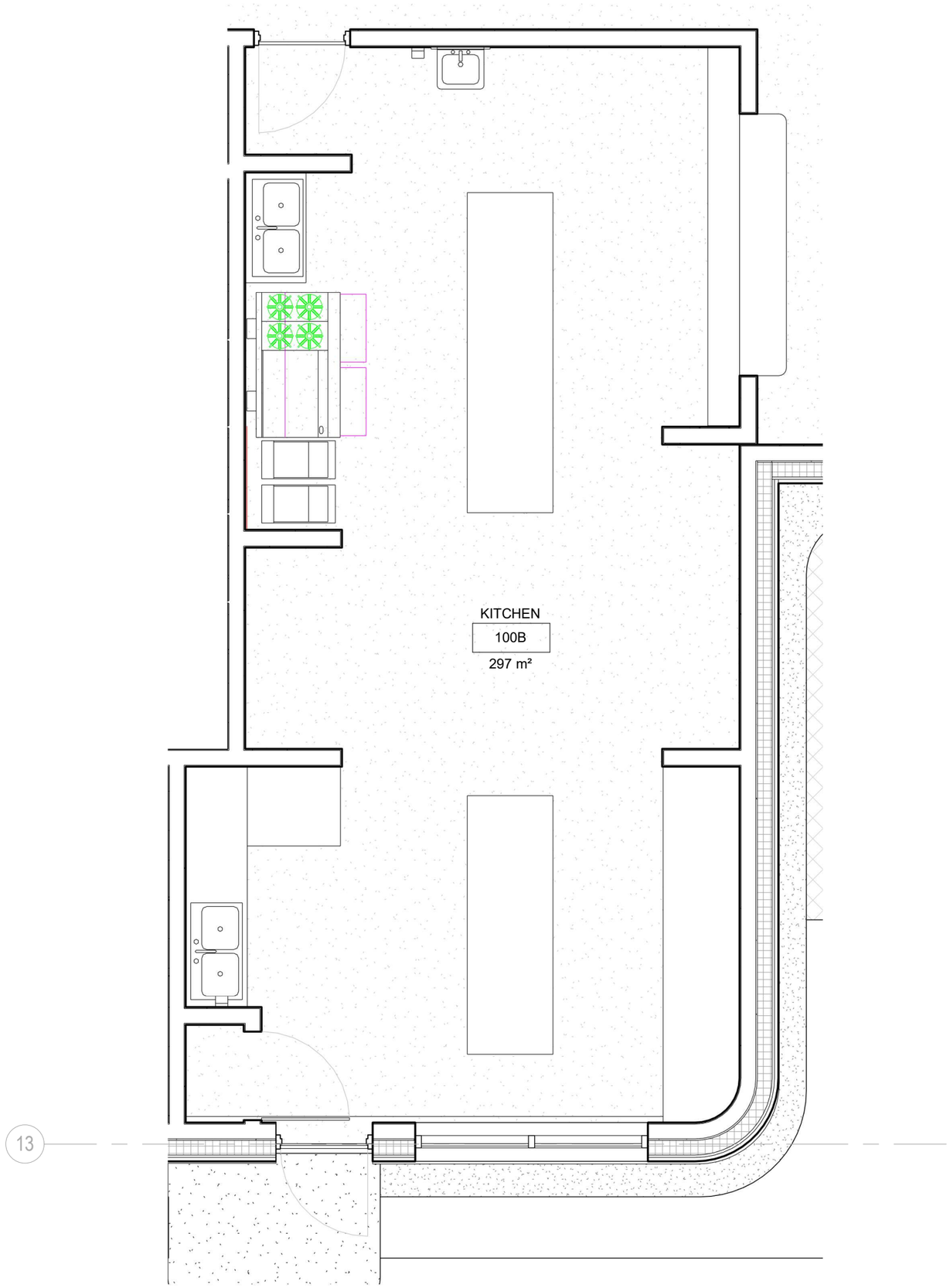
PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

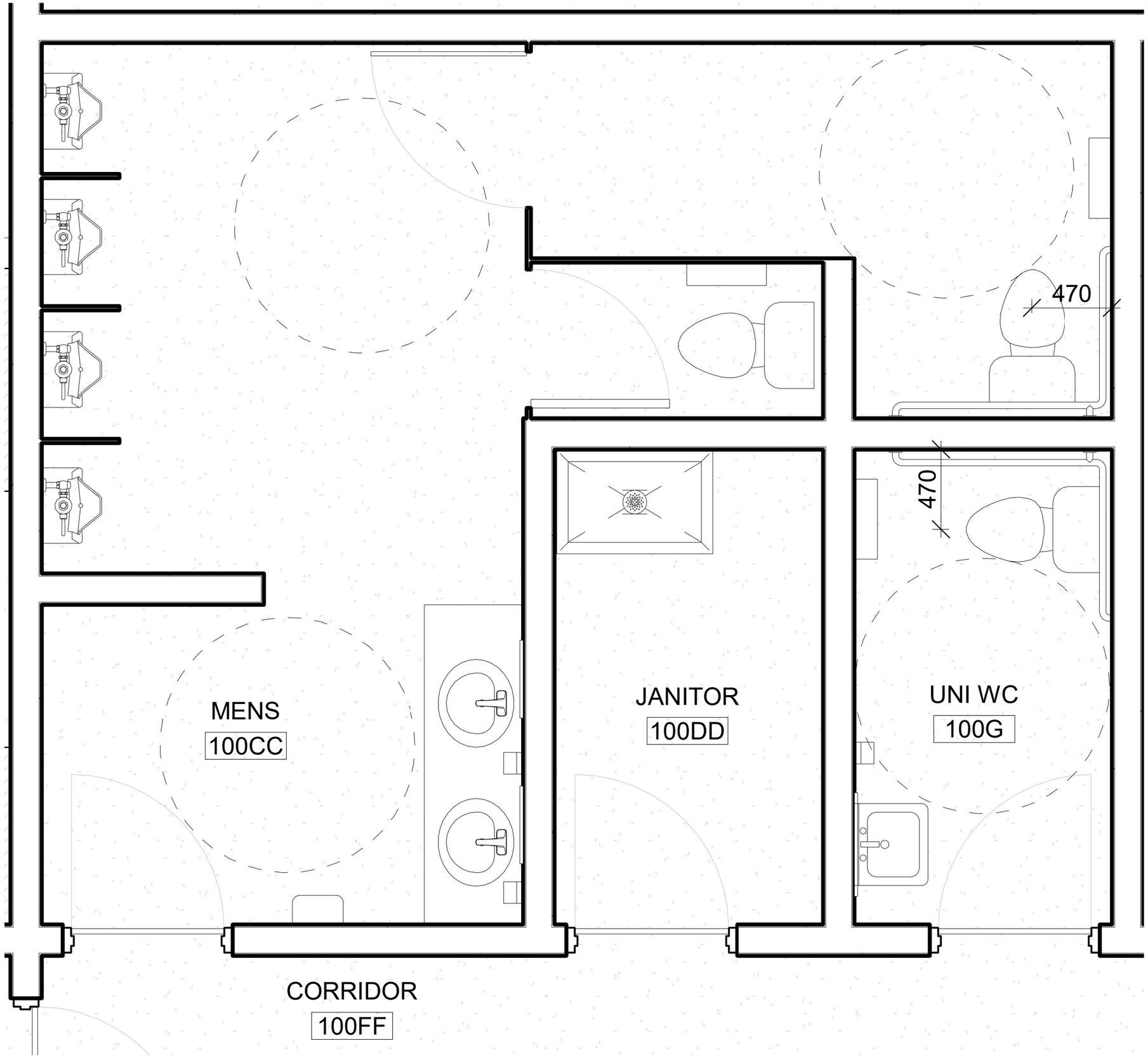
TITLE
WALL SECTIONS 3

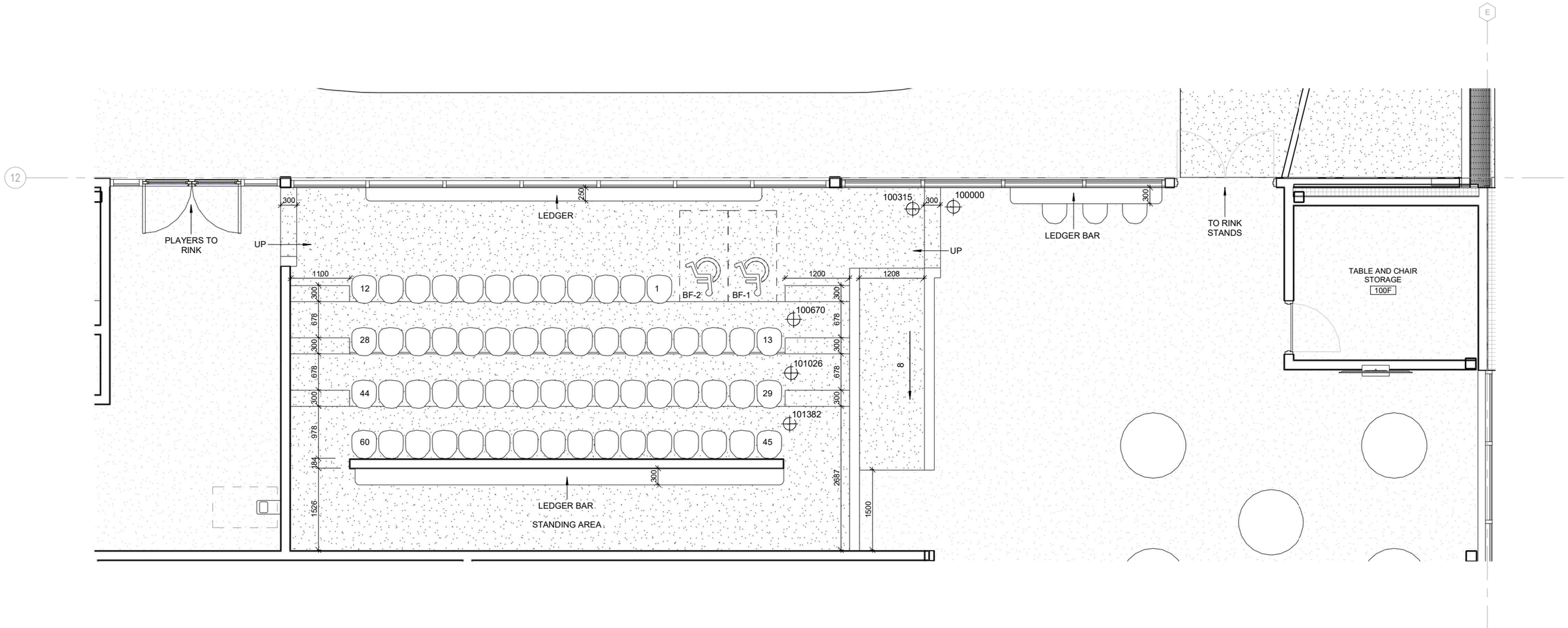
SCALE	1 : 20
PROJECT NUMBER	2024.01200
DRAWN BY	Author

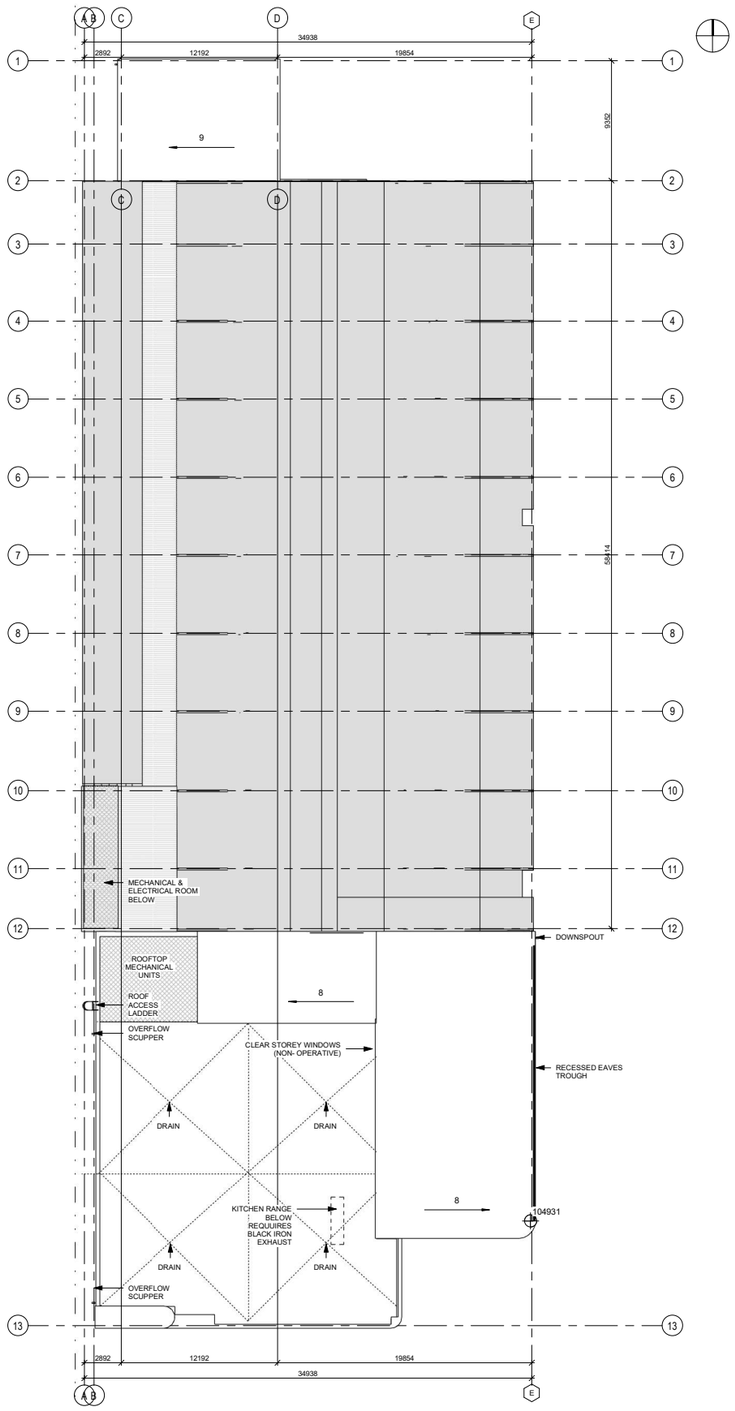
AE-312


C
D
1
2
ICE TRENCH
RESURFACER
ROOM
100BB
PROPOSED ICE
PLANT
100W


KITCHEN
100B
297 m²
13


470
470
MENS
100CC
JANITOR
100DD
UNI WC
100G
CORRIDOR
100FF


12
E
PLAYERS TO RINK
UP
300
LEDGER
250
100315
300
100000
LEDGER BAR
300
TO RINK STANDS
UP
1100
12
1
BF-2
BF-1
1200
1208
300
678
300
678
300
978
184
1526
100670
28
13
101026
44
29
101382
60
45
300
LEDGER BAR
STANDING AREA
2687
1500
8
TABLE AND CHAIR STORAGE
100F



1
AE-103

ROOF PLAN

1 : 200

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CONSULTANTS

NOTES

REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

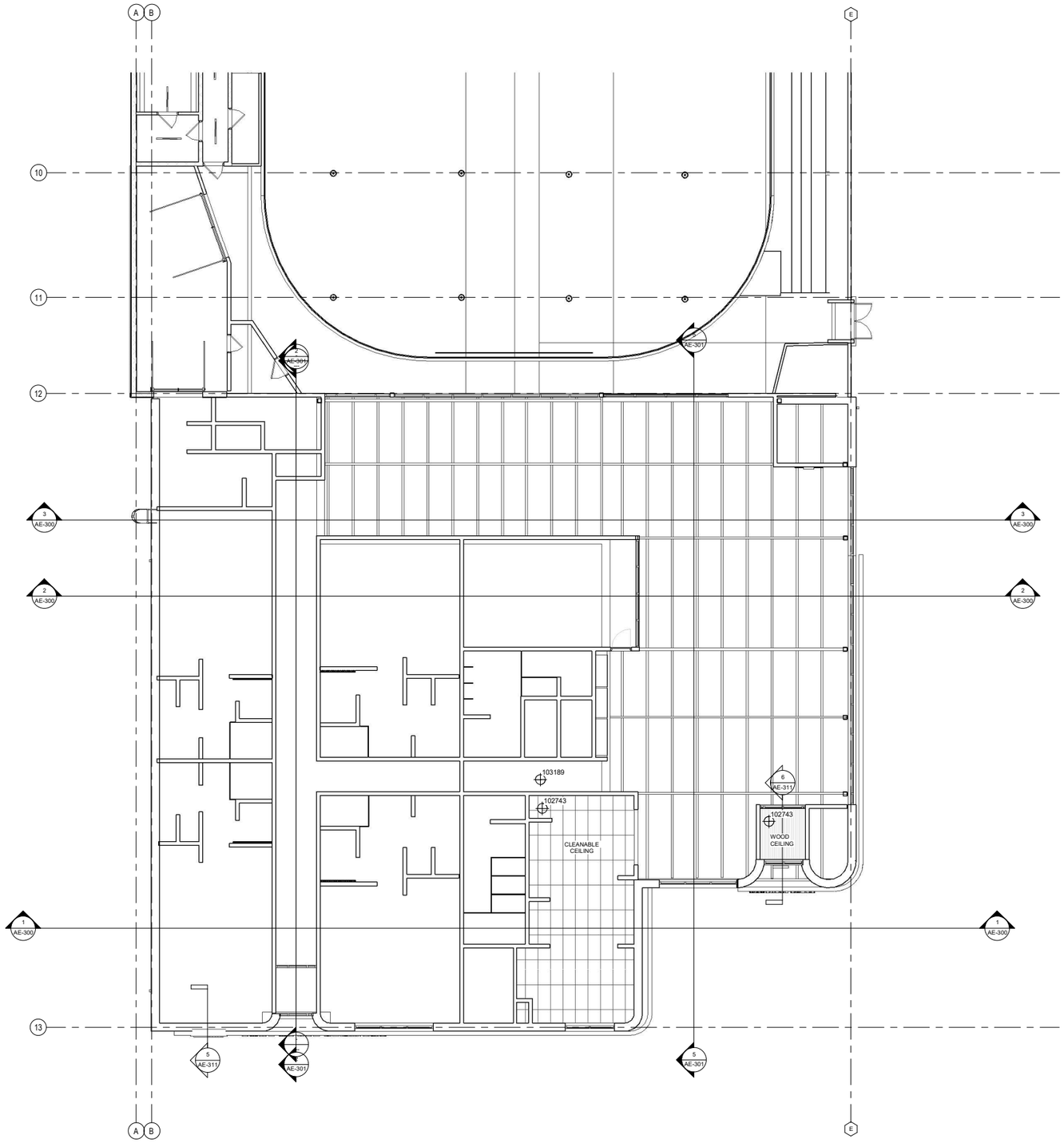
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
ROOF PLAN

SCALE	1 : 200
PROJECT NUMBER	2024.01200
DRAWN BY	Author

AE-103



1 AE-150 LEVEL 100
1 : 100

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PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

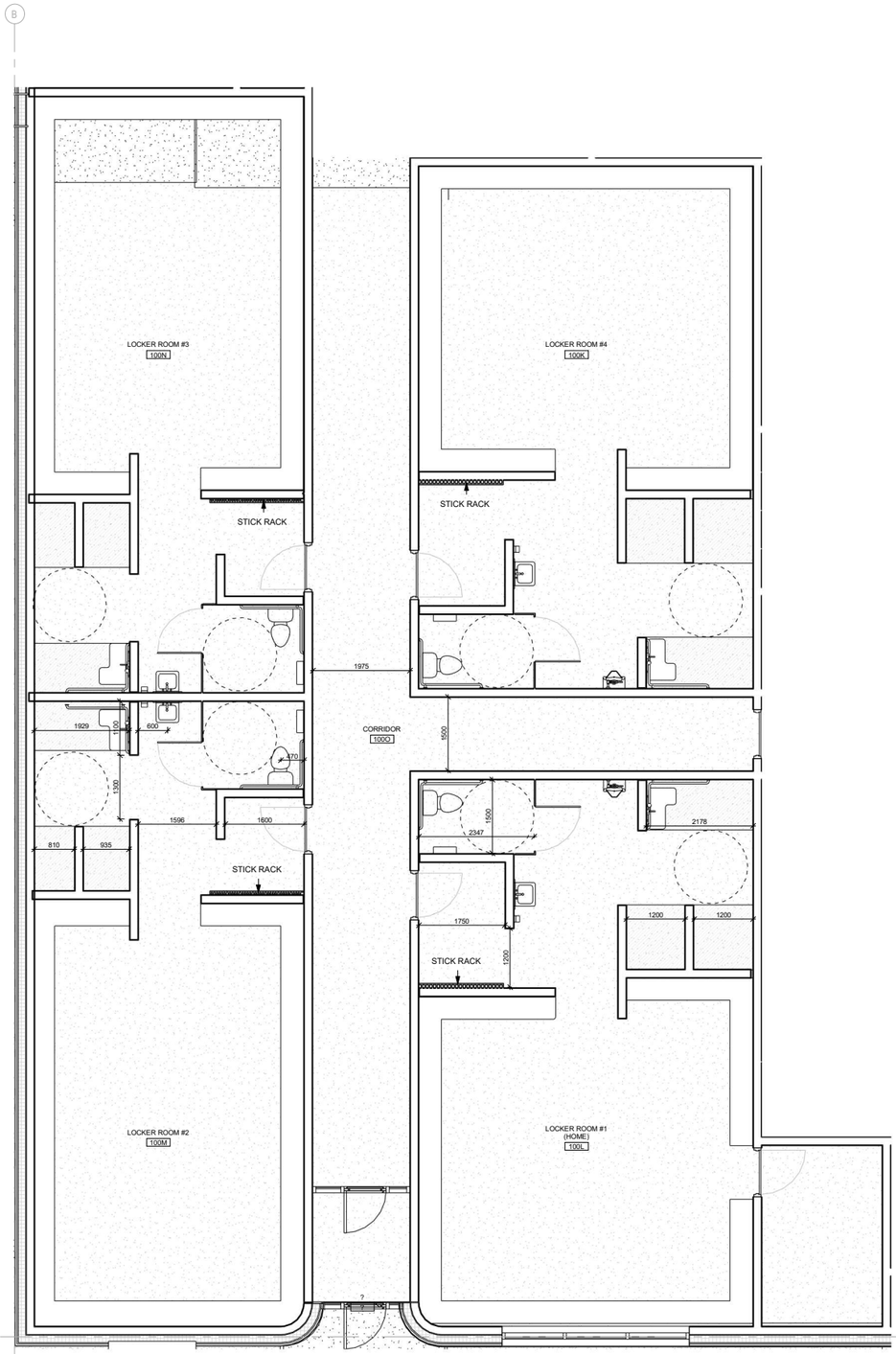
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

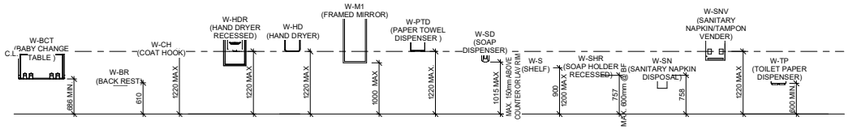
TITLE
LEVEL 100 FLOOR PLAN RCP

SCALE	1 : 100
PROJECT NUMBER	2024.01200
DRAWN BY	Author

AE-150

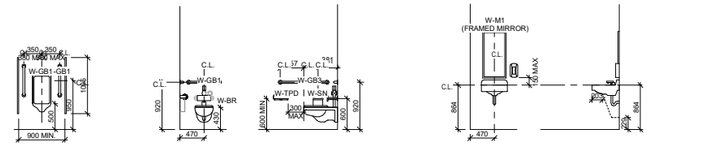


4 AE-400 ENLARGED LOCKER ROOMS
1 : 50



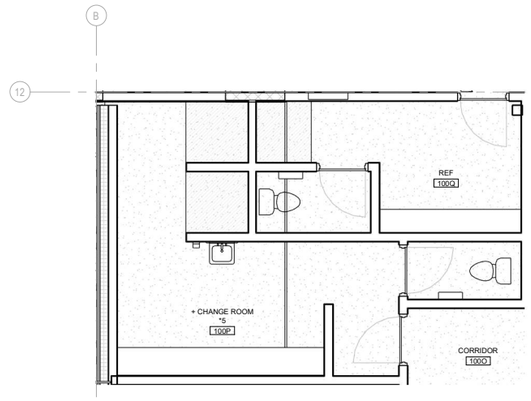
WASHROOM ACCESSORIES

TO BE REVISED - UPDATE TO MBC 2020 OR CSA B651



BF URINAL | BF STALL | BF STALL (SIDE ELEVATION) | **LAVATORY** | **LAVATORY (SIDE ELEVATION)**

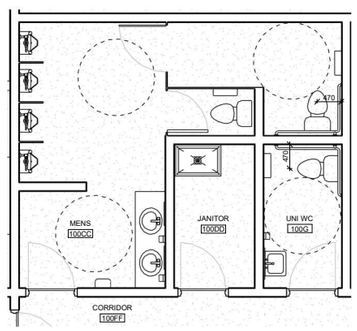
WASHROOM ELEVATIONS
1 : 50



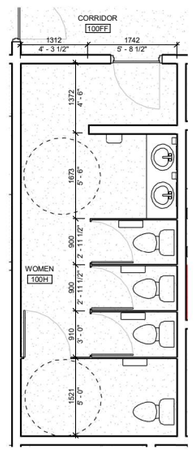
3 AE-400 ENLARGED + CHANGE & REF
1 : 50

WASHROOM ACCESSORIES LEGEND

W-BCT	BABY CHANGE TABLE
W-CH	COAT HOOK
W-FDS	FOLD DOWN SEAT
W-FND	FEMININE NAPKIN DISPOSAL
W-FNV	FEMININE NAPKIN VENDOR
W-FS	FOLDING SEAT
W-GBR1	GRAB BAR - 600mm LONG
W-GBR2	GRAB BAR - 760mm LONG
W-GBR3	GRAB BAR - 900mm LONG
W-GBR4	RIGHT ANGLE GRAB BAR - 900mmx900mm
W-HD	HAND DRYER
W-M1	FRAMED MIRROR
W-M2	FRAMED MIRROR (TBD)
W-MH	MOP HOLDER
W-PTD1	PAPER TOWEL DISPENSER
W-PTD2	PAPER TOWEL DISPENSER (SUPPLIED BY OWNER & INSTALLED BY GC)
W-SC	SHOWER CURTAIN & ROD
W-SD1	SOAP DISPENSER
W-SD2	SOAP DISPENSER (SUPPLIED BY OWNER & INSTALLED BY GC)
W-S	SHELF
W-SHR	SOAP HOLDER RECESSED
W-SN	SANITARY NAPKIN DISPOSAL
W-SNV	SANITARY NAPKIN/TAMPON VENDER
W-TP	TOILET PAPER DISPENSER



2 AE-400 ENLARGED PLAN MENS, JAN., UNI
1 : 50



1 AE-400 ENLARGED PLAN WOMENS WC
1 : 50

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NOTES

REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

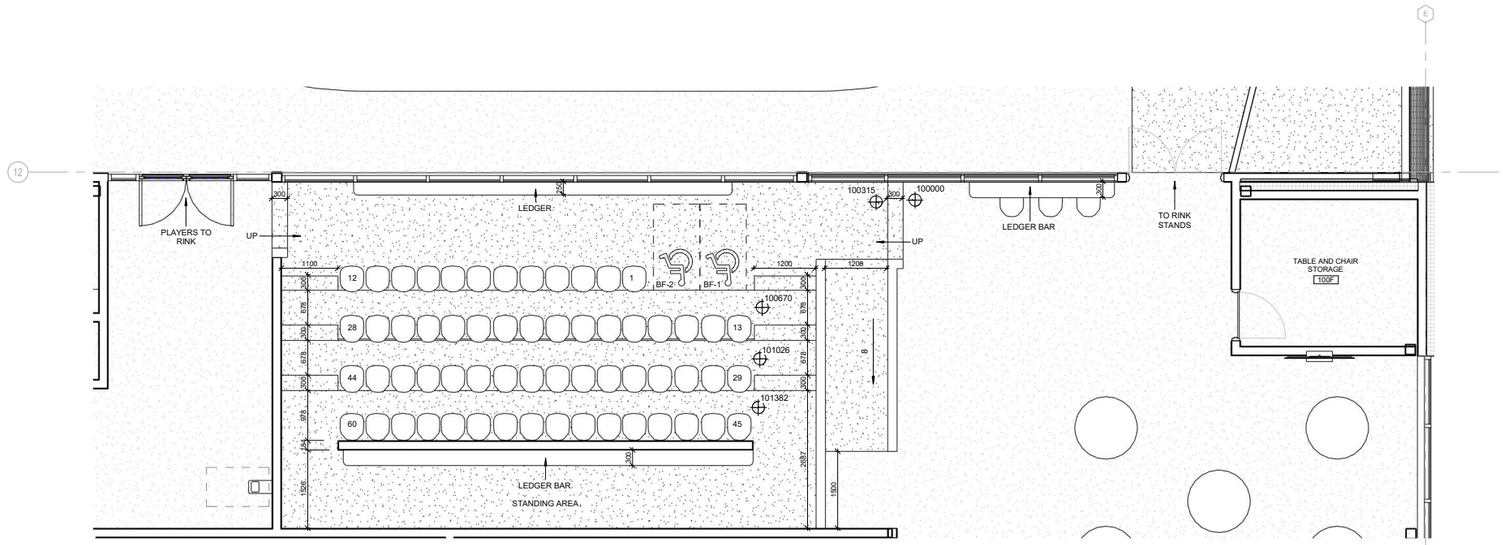
OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

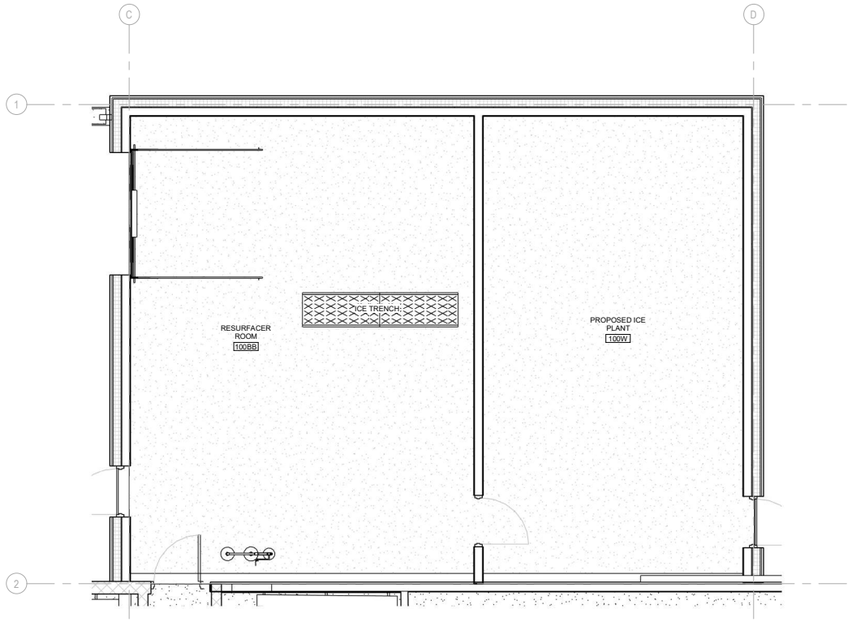
TITLE
LARGE SCALE PLANS

SCALE	As indicated
PROJECT NUMBER	2024.01200
DRAWN BY	Author

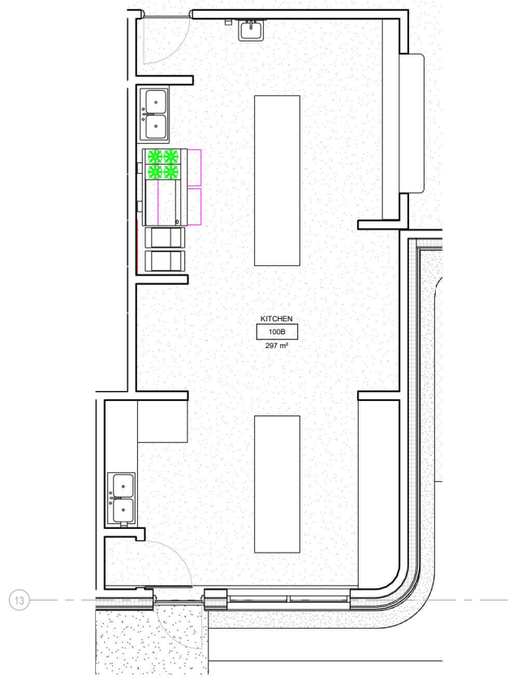
AE-400



2 AE-401 ENLARGED PLAN STANDS
1 : 50



3 AE-401 ENLARGED PLAN ICE PLANT & RESURFACER
1 : 50



1 AE-401 ENLARGED PLAN KITCHEN
1 : 50

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NOTES

REV	DATE	DESCRIPTION

PROJECT NORTH

PERMIT / STAMP

PRELIMINARY
NOT FOR CONSTRUCTION

OWNER
Owner

PROJECT NAME & ADDRESS
GRUNTHAL ARENA EXPANSION
GRUNTHAL, MB

TITLE
LARGE SCALE PLANS 2

SCALE 1 : 50
PROJECT NUMBER 2024.01200
DRAWN BY Author

AE-401

APPENDIX B

Test Hole Logs

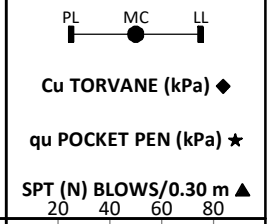
TEST HOLE LOG

HOLE NO.
TH26-01

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.26 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/09
DESCRIPTION	Southwest corner of the proposed southern expansion	**UTM (m)**	N 5,474,551.74
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,419.59 Zone 14
METHOD(S)	0.00 m to 7.62 m: 125 mm ø SSA 7.62 m to 12.19 m: 200 mm ø HSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	DESCRIPTION AND CLASSIFICATION	ELEV (m)	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE
269			**SILTY SAND (SM)** - Light brown, dry to damp, dense, fine to medium, some fine gravel, trace clay.						
268	1.0	5	- damp, dense below 1.52 m.			S1 S1a	83	19 19 12	31
267	2.0								
266	3.0	10	- PSA: 2% gravel, 74% sand, 19% silt, 5% clay at 2.7 m. - very dense, increasing fine sand, trace coarse gravel, decreasing silt below 3.05 m.			S2 S2a	100	22 50/ 130mm	+100
265	4.0	15		264.69		S3 S3a	80	40 50/ 100mm	+100
264	5.0		**POORLY GRADED SAND WITH SILT (SP-SM)** - Light brown, damp, very dense, fine, trace fine gravel.						
263	6.0	20	- damp to moist, trace silica sand below 6.10 m.			S4 S4a	100	31 50/ 100mm	+100
262	7.0	25	- PSA: 0% gravel, 93% sand, 5% silt, 2% clay at 7.3 m.			S5 S5a	80	28 50/ 100mm	+100
261	8.0		- wet at 8.08 m. - caving/heaving sand during drilling at 8.23 m.						
260	9.0	30				S6a	82	35 50/ 80mm	+100
259	10.0	35				S7a	82	15 50/ 80mm	+100
258	11.0								
257	12.0	40		257.07					
256	13.0								
255	14.0	45							
254	15.0	50							

Notes:
1. End of test hole at 12.19 m.
2. Test hole caved to 7.92 m upon completion of drilling/digging.
3. Test hole moved approx 0.5m south of the original location and re-drilled using hollow stem auger (HSA).
4. Test hole backfilled with auger cuttings and bentonite chips.



WATER LEVELS		
▽	**During Drilling/Digging**	8.08 m on 2026/02/09
▼	**Upon Completion**	7.92 m on 2026/02/10

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

KGS_LOG_U:\FMS\26-0604-001\26-0604-001 GRUNTHAL ARENA - GEOTECHNICAL INVESTIGATION - FEBRUARY 2026.GPJ

TEST HOLE LOG

HOLE NO.
TH26-02

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.27 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/10
DESCRIPTION	Southwest corner of the parking lot	**UTM (m)**	N 5,474,528.93
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,427 Zone 14
METHOD(S)	0.00 m to 3.05 m: 125 mm ø SSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (PL MC LL; 20 40 60 80)
269				**SILTY SAND (SM)** - Light brown, dry, very dense, fine to coarse, trace fine gravel.								
	1.0							S1				
268		5		- dry to damp, very dense, decreasing silt, less gravel, trace silica below 1.52 m.				S2	67	50	+100	>>
	2.0											
267								S3				
	3.0	10			266.08			S4	92	50/ 140mm	+100	>>
266				Notes: 1. End of test hole at 3.19 m. 2. Test hole remained open to 3.19 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings.								
	4.0											
265		15										
	5.0											
264												
	6.0	20										
263												
	7.0											
262		25										
	8.0											
261												
	9.0	30										
260												
	10.0											
259		35										
	11.0											
258												
	12.0	40										
257												
	13.0											
256		45										
	14.0											
255												
	15.0	50										
254												

WATER LEVELS		
	During Drilling/Digging	on 2026/02/10 None Encountered
	Upon Completion	on 2026/02/10 None Encountered

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

KGS_LOG_U:\FMS\26-0604-001\26-0604-001 GRUNTHAL ARENA - GEOTECHNICAL INVESTIGATION - FEBRUARY 2026.GPJ

TEST HOLE LOG

HOLE NO.
TH26-03

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.29 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/10
DESCRIPTION	Middle area of the parking lot	**UTM (m)**	N 5,474,541.6
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,444.51 Zone 14
METHOD(S)	0.00 m to 3.05 m: 125 mm ø SSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	PL MC LL / Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (20 40 60 80)
				SILTY SAND (SM) - Light brown, dry, very dense, fine to medium, trace fine gravel.								
	1.0							S1				
		5		- dry to damp, very dense, increasing medium sand, decreasing silt below 1.52 m.				S2	83	50/ 130mm	+100	>>▲
	2.0											
								S3				
	3.0	10			266.00			S4	95	24 50/ 90mm	+100	>>▲

Notes:
1. End of test hole at 3.29 m.
2. Test hole remained open to 3.29 m upon completion of drilling/digging.
3. Test hole backfilled with auger cuttings.

WATER LEVELS		
▽ **During Drilling/Digging**	on 2026/02/10 None Encountered	
▼ **Upon Completion**	on 2026/02/10 None Encountered	

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

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TEST HOLE LOG

HOLE NO.
TH26-04

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.41 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/10
DESCRIPTION	Southeast corner of the parking lot	**UTM (m)**	N 5,474,530.66
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,454.35 Zone 14
METHOD(S)	0.00 m to 3.05 m: 125 mm ø SSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (PL MC LL; 20 40 60 80)
269				**SILTY SAND (SM)** - Light brown, dry, very dense, fine to medium, trace fine gravel.								
	1.0							S1	89	40 50	+100	>>
268		5		- dry to damp, very dense, decreasing silt below 1.52 m.				S2				
	2.0											
267								S3				
	3.0	10			266.21			S4	100	50	+100	>>
266				Notes: 1. End of test hole at 3.20 m. 2. Test hole remained open to 3.20 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings and bentonite chips.								
	4.0											
265		15										
	5.0											
264												
	6.0	20										
263												
	7.0											
262		25										
	8.0											
261												
	9.0	30										
260												
	10.0											
259		35										
	11.0											
258												
	12.0	40										
257												
	13.0											
256		45										
	14.0											
255												
	15.0	50										
254												

WATER LEVELS
- **During Drilling/Digging** on 2026/02/10 None Encountered
- **Upon Completion** on 2026/02/10 None Encountered

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

KGS_LOG_U:\FMS\26-0604-001\26-0604-001 GRUNTHAL ARENA - GEOTECHNICAL INVESTIGATION - FEBRUARY 2026.GPJ

TEST HOLE LOG

HOLE NO.
TH26-05

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.34 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/10
DESCRIPTION	Norheast corner of the parking lot	**UTM (m)**	N 5,474,563.81
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,448.29 Zone 14
METHOD(S)	0.00 m to 3.05 m: 125 mm ø SSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	PL MC LL / Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (20 40 60 80)
269				**SILTY SAND (SM)** - Light brown, dry, very dense, fine to medium, trace fine gravel.								
	1.0							S1				
268		5		- dry to damp, very dense, decreasing silt below 1.52 m.				S2	50	50/ 80mm	+100	>>▲
	2.0											
267								S3				
	3.0	10			266.14			S4	100	50	+100	>>▲
266				Notes: 1. End of test hole at 3.20 m. 2. Test hole remained open to 3.20 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings and bentonite chips.								
	4.0											
265		15										
	5.0											
264												
	6.0	20										
263												
	7.0											
262		25										
	8.0											
261												
	9.0	30										
260												
	10.0											
259		35										
	11.0											
258												
	12.0	40										
257												
	13.0											
256		45										
	14.0											
255												
	15.0	50										
254												

WATER LEVELS		
▽	**During Drilling/Digging**	on 2026/02/10 None Encountered
▼	**Upon Completion**	on 2026/02/10 None Encountered

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

KGS_LOG_U:\FMS\26-0604-001\26-0604-001 GRUNTHAL ARENA - GEOTECHNICAL INVESTIGATION - FEBRUARY 2026.GPJ

TEST HOLE LOG

HOLE NO.
TH26-06

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.26 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/10
DESCRIPTION	East of the proposed southern expansion	**UTM (m)**	N 5,474,579.98
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,442.68 Zone 14
METHOD(S)	0.00 m to 3.05 m: 125 mm ø SSA 3.05 m to 13.72 m: 200 mm ø HSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (PL MC LL; 20 40 60 80)
269				**SILTY SAND (SM)** - Light brown, dry to damp, very dense, fine to coarse, trace fine gravel, hard drilling. - -1.2 °C at 0.30 m. - +3.0 °C at 0.61 m. - +6.0 °C at 1.22 m. - damp, increasing coarse sand, increasing fine gravel below 1.52 m.								
	1.0							S1				
268		5										
	2.0											
267								S2				
	3.0	10						S3	90	29 50/ 100mm	+100	>>
266												
	4.0											
265		15			264.69							
				POORLY GRADED SAND WITH SILT (SP-SM) - Light brown, damp, very dense, fine, trace fine gravel.				S4	100	31 50/ 80mm	+100	>>
	5.0											
264												
	6.0	20						S5	90	25 50/ 100mm	+100	>>
263												
	7.0											
262		25				▼		S6	100	26 50/ 50mm	+100	>>
	8.0			- wet below 7.92 m.								
261												
	9.0	30		- torquing-out at 8.84 m. - grey, moist to wet, trace to some clay and silt below 9.14 m.				S7	92	50/ 140mm	+100	>>
260												
	10.0											
259		35		- increasing clay in sampler below 10.67 m.				S8	100	40 50/ 100mm	+100	>>
	11.0											
258												
	12.0	40		- grey, wet, silty in sampler below 12.19 m.				S9	86	50	+100	>>
257												
	13.0											
256		45		- wet, very loose, no recovery in sampler below 13.72 m.	255.09				0	1		
	14.0											
255				Notes: 1. End of test hole at 14.17 m. 2. Test hole caved to 13.41 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings and bentonite chips.								
	15.0	50										
254												

WATER LEVELS
- ▽ **During Drilling/Digging** 7.92 m on 2026/02/10
- ▼ **Upon Completion** 7.92 m on 2026/02/11

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **M. RODRIGUEZ**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

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TEST HOLE LOG

HOLE NO.
TH26-07

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT	**Grunthal Arena Expansion - Geotechnical Services**	**SURFACE ELEV.**	269.03 m
LOCATION	Grunthal, Manitoba	**START DATE**	2026/02/11
DESCRIPTION	~20 m east of the proposed north garage and ice plant extension	**UTM (m)**	N 5,474,659.34
DRILL RIG / HAMMER	Acker MP5 Track Mounted Drill Rig		E 655,440.38 Zone 14
METHOD(S)	0.00 m to 1.52 m: 125 mm ø SSA 1.52 m to 2.29 m: 200 mm ø HSA 2.29 m to 10.67 m: 125 mm ø SSA		

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER	RECOVERY %	BLOWS/0.15 m	N-VALUE	PL MC LL / Cu TORVANE (kPa) ◆ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m ▲ (20 40 60 80)
				SILTY SAND (SM) - Brown, dry, very dense, fine to coarse, with gravel. - hard drilling from 0.30 m to 1.37 m.								
268	1.0											
		5		- brown, moist, fine to medium, trace coarse sand and gravel below 1.52 m. - +4.0 °C at 1.53 m. - refusal using HSA augers at 2.3 m, switched to SSA to advance at 2.29 m.				S1	100	50/ 100mm	+100	>>
267	2.0											
266	3.0	10		- dry, trace coarse sand and gravel below 2.74 m. - PSA: 2% gravel, 59% sand, 30% silt, 9% clay at 3.0 m.	265.70			S2	82	39 50/ 130mm	+100	>>
265	4.0			**WELL GRADED SAND WITH SILT (SW-SM)** - Brown, moist, very dense, fine to coarse, trace silt and clay. - moist, fine to medium, trace clay below 3.66 m. - decreasing silt content below 3.81 m.								
		15		- dry, fine, trace silt and clay, trace fine gravel below 4.57 m.				S3	82	13 50/ 130mm	+100	>>
264	5.0											
263	6.0	20		- moist, interbedded silt layer from 6.10 m to 6.17 m. - some medium to coarse sand below 6.18 m.				S4	100	50 50/ 30mm	+100	>>
262	7.0											
		25		- tan, moist, fine to coarse below 7.62 m. - PSA: 1% gravel, 87% sand, 9% silt, 3% clay at 7.6 m.				S5	100	50 50/ 50mm	+100	>>
261	8.0			- increasing moisture, increasing medium to coarse below 8.23 m.								
260	9.0	30		- wet, trace fine gravel below 9.14 m.		▽		S6	94	27 45 50/ 130mm	+100	>>
259	10.0			- grey, wet, some medium to coarse, silty below 9.75 m.								
		35			258.18			S7 S8	86	45 50/ 30mm	+100	>>
258	11.0			Notes: 1. End of test hole at 10.85 m. 2. Test hole caved to 8.84 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings and bentonite chips.								
257	12.0	40										
256	13.0											
		45										
255	14.0											
254	15.0	50										

WATER LEVELS	▽ **During Drilling/Digging**	9.14 m on 2026/02/11
	▼ **Upon Completion**	on 2026/02/11 Dry after Drilling

CONTRACTOR **Maple Leaf Drilling Ltd.**	INSPECTOR **I. DENISET**
APPROVED T. SCHELLENBERG	DATE 2026-03-26

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KEY TO SYMBOLS

LITHOLOGIC SYMBOLS

Silty Sand (SM)

Poorly Graded Sand (SP)

Well Graded Sand with Silt (SW)

SAMPLER SYMBOLS

Auger Grab

SPT Split Spoon

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - Liquid Limit
PL - Plastic Limit
PI - Plastic Index
MC - Moisture Content
DD - Dry Density
NP - Non-Plastic
-200 - Percent Passing No. 200 Sieve
TV - Torvane (kPa)
PP - Pocket Penetrometer (kPa)
PSA - Particle Size Analysis
TOC - Top Of Casing

PN - Pneumatic Piezometer
VW - Vibrating Wire Piezometer
PID - Photoionization Detector
ppm - Parts Per Million
Water Level During Drilling
Water Level Upon Completion of Drilling
Water Level Remeasured/Static

APPENDIX C

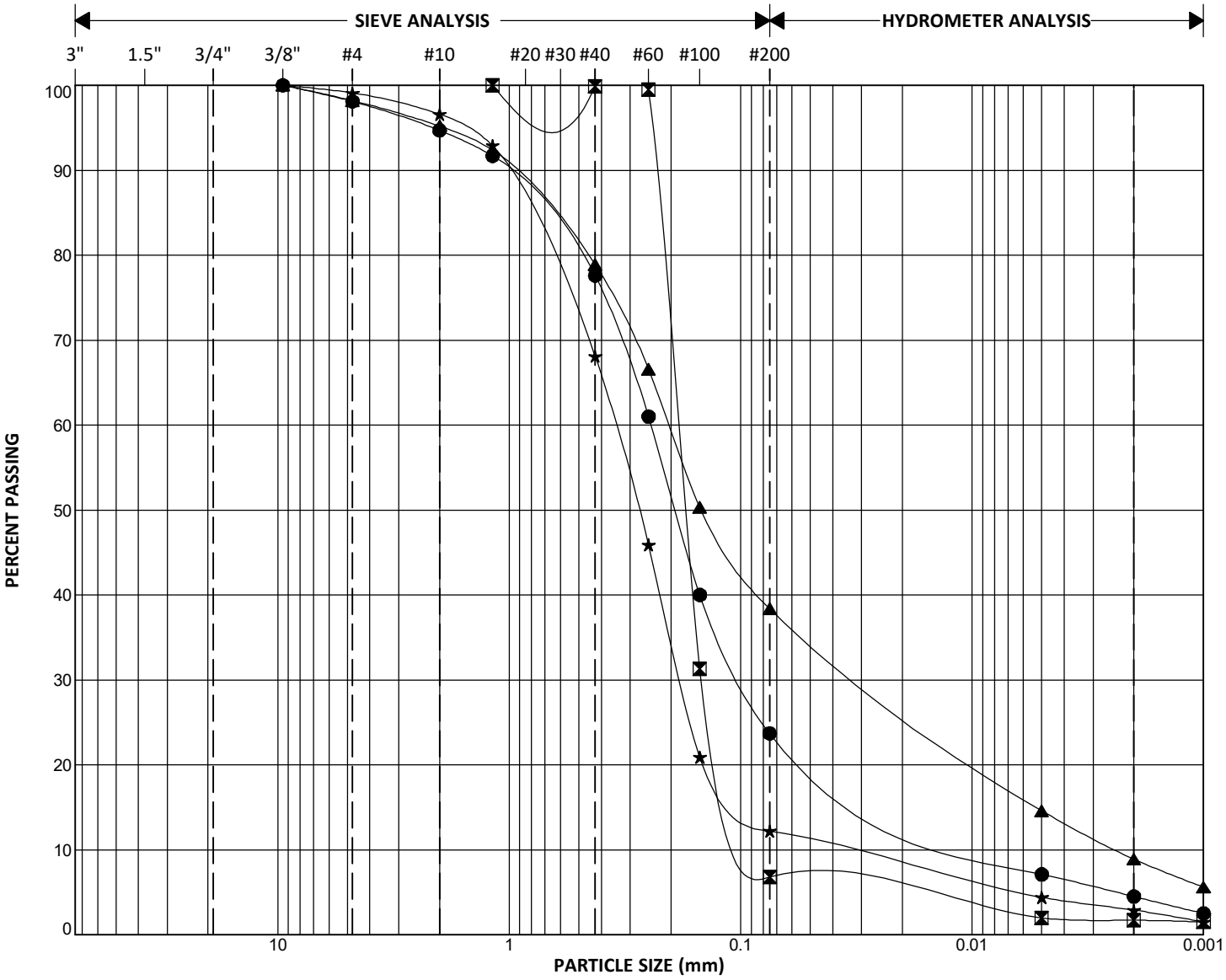
Laboratory Test Results

SUMMARY OF INDEX TESTS

Test Hole ID	Sample No.	Depth (m)	Class-ification	Gravel (%)	Sand (%)	Silt/ Clay (%)	Liquid Limit	Plastic Limit	Plas-ticity Index	Moisture Content (%)	Dry Density (kN/m3)	Specific Gravity	Satur-ation (%)	Void Ratio
TH26-01	S1a	1.5	SM							4				
TH26-01	S2	2.7	SM	2	74	24								
TH26-01	S2a	3.0	SM							13				
TH26-01	S3a	4.6	SP-SM							10				
TH26-01	S4a	6.1	SP-SM							8				
TH26-01	S5	7.3	SP-SM	0	93	7								
TH26-01	S5a	7.6	SP-SM							19				
TH26-01	S6a	9.1	SP-SM							19				
TH26-01	S7a	10.7	SP-SM							21				
TH26-02	S1	0.9	SM							11				
TH26-02	S3	2.4	SM							4				
TH26-03	S1	0.9	SM							3				
TH26-03	S3	2.4	SM							2				
TH26-04	S1	0.9	SM							2				
TH26-04	S3	2.4	SM							2				
TH26-05	S1	0.9	SM							6				
TH26-05	S3	2.4	SM							2				
TH26-06	S1	0.9	SM							3				
TH26-06	S2	2.4	SM							2				
TH26-06	S3	3.0	SM							4				
TH26-06	S4	4.6	SP-SM							6				
TH26-06	S5	6.1	SP-SM							2				
TH26-06	S6	7.6	SP-SM							4				
TH26-06	S8	10.7	SP-SM							20				
TH26-07	S1	1.5	SM							11				
TH26-07	S2	3.0	SM	2	60	38				8				
TH26-07	S3	4.6	SW-SM							5				
TH26-07	S4	6.1	SW-SM							5				
TH26-07	S5	7.6	SW-SM	1	87	12				5				
TH26-07	S6	9.1	SW-SM							12				
TH26-07	S7	10.4	SW-SM							18				
TH26-07	S8	10.7	SW-SM							20				

* Moisture conditioned and remolded sample.
** Assumed specific gravity.

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

	HOLE	DEPTH (m)	SAMPLE #	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	SILT & CLAY (%)	Cu	Cc	CLASSIFICATION
●	TH26-01	2.7	S2	2	74	19	5	24	30.40	4.91	SM
⊠	TH26-01	7.3	S5	0	93	5	2	7	2.27	1.37	SP-SM
▲	TH26-07	3.0	S2	2	60	30	9	38	85.17	1.71	SM
★	TH26-07	7.6	S5	1	87	9	3	12	10.02	2.67	SW-SM

KGS GROUP

CLIENT	**RM OF HANOVER**	**PROJECT NO.**	26-0604-001
PROJECT NAME	Grunthal Arena Expansion - Geotechnical Services	**LOCATION**	Grunthal, Manitoba
TESTED BY	Stantec	**DATE TESTED**	February 26, 2026

KGS GROUP

Experience in Action

KEYSTONE Surveys M.L.S. INC.
LAND SURVEYING & GEOMATICS
JOHAN DYCK M.L.S. IAN BALDWIN M.L.S.

SURVEYOR'S BUILDING LOCATION CERTIFICATE

April 13, 2026 Our File No. 2026.148

Mr. Bronson Pritchett
R.M. of Hanover
28 Westland Drive
Mitchell, MB R5G 2N9

Dear Mr. Pritchett:

RE: Albert Ave, R.M. of Hanover (Grunthal), Manitoba

Legal Description: FIRSTLY: PARCEL A PLAN 50458 WLTO EXC: ALL MINES AND MINERALS AND OTHER MATTERS AS SET FORTH IN CROWN LANDS ACT. IN SE 1/4 21-5-5 EPM SECONDLY: LOT 87 PLAN 6152 WLTO EXC FIRSTLY: THE WLY 629 FEET AND SECONDLY: THE NLY 200 FEET IN SECTION 21-5-5 EPM

Certificate of Title: 2482464/1 (Searched: March 30, 2026)

Registered Owner(s): The Rural Municipality of Hanover

Encumbrances: Instrument No.'s 5374014/1 and 5374015/1 are registered against the above Certificate of Title. The encumbrances are noted for reference purposes only and no attempt has been made to interpret intent or extent.

This is to certify that I have made the necessary measurements to determine the position of a Metal/Brick Arena, un-numbered, on the South side of Albert Avenue, in the R.M. of Hanover (Grunthal) and find that the same, above ground level, is contained entirely within the limits of the above described land, except the encroachments shown on the sketch.

There are no encroachments above ground level onto the above described land by buildings from adjoining properties.

This survey was completed on April 6th and 8th, 2026.

See sketch – Page 2

CERTIFIED A TRUE COPY
DATED APR 13 2026
M.L.S.

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Johan Dyck, P.Surv, M.L.S.

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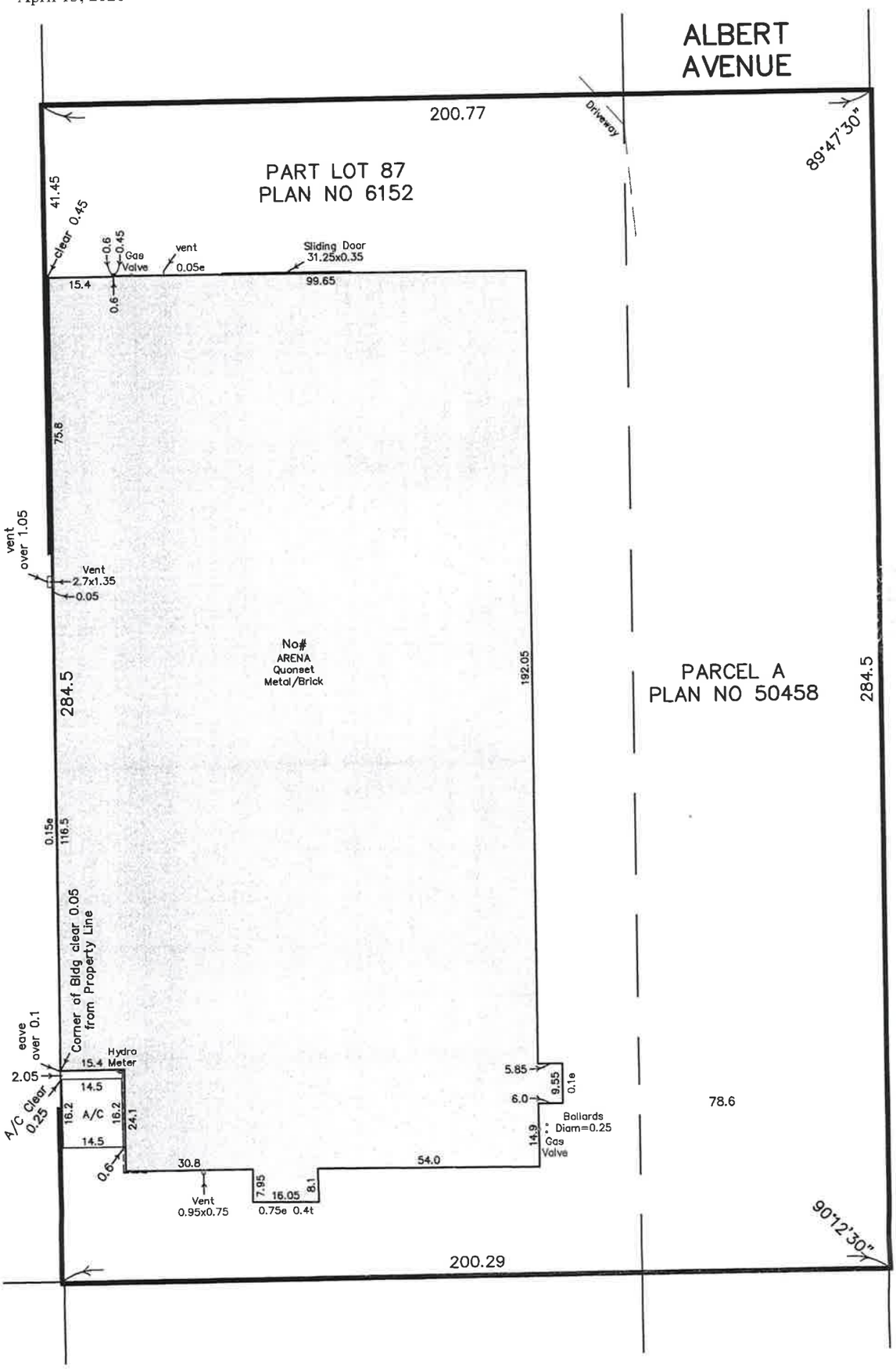
KEYSTONE Surveys M.L.S. INC.

LAND SURVEYING & GEOMATICS

JOHAN DYCK M.L.S. IAN BALDWIN M.L.S.

April 13, 2026

Our File No. 2026.148



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ASSOCIATION OF MANITOBA LAND SURVEYORS
PERMIT
KEYSTONE SURVEYS M.L.S. INC.
No. 2016-2

Surveyor's Building Location Certificate

Distances are in feet and decimals of a foot.
No survey monuments were requested to be installed at property corners.

Field Book: 418/67-69 Drafter: AR

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Johan Dyck, P.Surv, M.L.S.

406 Main Street Steinbach, Manitoba R5G 1Z5
Phone: (204) 326-2117 Fax: (204) 326-5939 info@keystonesurveys.ca www.keystonesurveys.ca

Asbestos Survey Report – RM of Hanover

Prepared for:
RM of Hanover
28 Westland Drive
Mitchell, MB

MWI Consultants Inc.
Phone: (204) 781-6131
Email: info@mwiconsultants.ca
Website: mwiconsultants.ca

Asbestos Containing Materials Survey Report

LOCATION: RM of Hanover Buildings
RM of Hanover, Manitoba

INSPECTION DATE: September 22, 2023 to October 17, 2023

REPORT DATE: January 15, 2024

1.0 SUMMARY

MWI Consultants completed an evaluation for asbestos-containing materials (ACMs) within buildings maintained by the Rural Municipality of Hanover in Manitoba. Building surveys were completed in communities of Mitchell, Blumenort, Kleefeld, New Bothwell and Grunthal. The surveys were completed at the request of the RM of Hanover.

Building surveys were completed for all buildings maintained by the RM of Hanover to determine whether materials which may be affected were asbestos-containing materials (ACMs).

For the Mitchell Arena (1978), the cement plaster walls in viewing area for the rink contain small amounts of asbestos (1% - 5% chrysotile, non-friable) and there are asbestos-containing floor tiles in some areas (1% - 5% chrysotile, non-friable). Vermiculite insulation was observed in a basement utility room, and the cinder block walls for the building are likely filled with vermiculite, at least in some areas. Vermiculite is presumed to contain small amounts of amphibole asbestos (actinolite/tremolite) as a contaminant.

For the Kleefeld Fire Hall (1981), drywall joint compound (DJC) in different areas was found to contain small amounts of asbestos; newer materials are also in place from more recent renovations and do not contain asbestos. Different styles of sheet flooring in different parts of the building were also found to contain asbestos. The ACM are presumably original materials.

For the Blumenort Recreation Centre (1982), the thick black flooring in 12” planks located in the storage room area was found to contain 10% - 25% chrysotile asbestos. Flooring is non-friable.

No other ACM were detected in samples of suspect materials collected from the other building included in the scope of the survey. Newer buildings were surveyed without the collection of samples.

This report summarizes the results of the inspections and evaluations of the condition of any ACM identified, as well as the results of the bulk sampling of suspected ACMs.

2.0 BUILDING AND SURVEY METHODOLOGY

2.1. Scope of Work

Based on the site conditions and plans for the building, it was determined that the survey would focus on the following:

- Asbestos-Containing Material (ACM)

The scope of work was to provide a survey report based on an inspection for and a collection of representative samples of suspect ACM for laboratory analysis. Based on the survey and results obtained, a baseline asbestos survey report will be prepared which identifies the type and location of all observed ACM and brief recommendations for removal prior to the start of any planned building renovation and/or demolition.

2.2. Asbestos-Containing Materials

The use of hazardous substances in building materials, products and equipment was common until the late 1970s. Buildings constructed prior to 1990 may contain some suspect ACMs, and materials must be evaluated prior to renovation or demolition activities.

Refer to Appendix 4 for additional information.

3.0 SURVEY RESULTS

3.1. Asbestos-Containing Materials

Surveys were completed for building maintained by the RM of Hanover, as requested by the RM of Hanover in a Request for Proposal with submissions dated prior to August 15, 2023.

The building surveys were coordinated with representatives from the RM of Hanover and were completed between September 22, 2023 and October 17, 2023. The approximate square footage and year of construction referenced in the report were provided by the RM of Hanover.

The buildings included in the survey were:

Grunthal

Grunthal Arena (1968, 25,000 SF): Arena was surveyed September 26, 2023 and no ACM were identified for the building. Samples were collected of joint compound and flooring. Joint compound samples were collected in different parts of the building and no asbestos was detected (refer to Photos 1 to 4).

Grunthal Fire Hall (2010, 7,200 SF): Building was built after 1990 and samples were not collected. No suspect materials identified based on age of construction (refer to Photo 5).

Grunthal Park/Pool Building (1967/2007, 3,400 SF): Samples of joint compound and exterior stucco were collected and no asbestos was detected. Metal soffits and attic space is insulated with cellulose. Concrete was painted but flooring not present. No ACM identified (D956). A small machine shed (450 SF) was also surveyed and no suspect ACM identified (refer to Photo 6, 7).

Grunthal Motocross Washroom (1990, 340 SF): A small washroom building consisting of metal and wood (refer to Photo 8). No suspect ACM identified.

Grunthal Motocross Canteen (1990, 750 SF): A small building consisting primarily of metal and wood (refer to Photo 9). No suspect ACM identified.

Grunthal Water Treatment Plant (1974, 660 SF): Small cinder block building; no vermiculite observed and no suspect ACM identified. Additional buildings on the site were surveyed and no suspect ACM identified (refer to Photo 10).

Grunthal Soccer Shed (1990, 625 SF): Metal exterior building reportedly built 1990. Samples were collected of joint compound and no asbestos was detected (D954). Refer to Photo 11.

Grunthal Public Works Facility (1997, 1500 SF): Building was built after 1990 and samples were not collected. No suspect materials identified based on age of construction. Refer to Photo 12.

Kleefeld

Kleefeld Recreation Centre (1985, 3,000 SF): Survey was completed October 6, 2023. Suspect materials sampled include drywall joint compound, flooring and exterior stucco (D1081). No asbestos was detected in the samples. No ACM identified for the building. Refer to Photo 13 to 16.

Hanover Public Works Building (2015, 21,200 SF): Survey was completed on September 26, 2023 and October 6, 2023. Main building is newer and suspect materials were not identified based on age of construction. The adjacent Cold Storage building (2015, 7600 SF) was also surveyed; steel and wood building used for storage. The Hanover IT Shack was surveyed and samples of floor tiles were collected and no asbestos was detected (D1085). Refer to Photo 19 to 21.

Kleefeld Park Canteen and Equipment Shed: No ACM were identified. Refer to Photos 17 and 18.

Kleefeld Fire Hall (1980, 5,900 SF): The fire hall was surveyed and ACM were identified. Drywall joint compound sampled from the storage room in north part of the building and the from under the stairs in the south part of the building were found to contain asbestos.

Flooring present in the second floor north space and in the main floor fire hall space under the stairs was also found to contain asbestos.

Refer to Photo 22 to 26.

Kleefeld Water Treatment Plant Building (2010, 2300 SF): Building and associated shed building were surveyed and no suspect ACM identified. Refer to Photo 27. These are newer buildings.

New Bothwell

New Bothwell Fire Hall (1959, 3100 SF): Building was surveyed on October 6, 2023 and samples of joint compound were collected. No asbestos was detected in the samples (D1087). No ACM identified for the building. Refer to Photo 28.

New Bothwell Recreation Centre (1974, 4300 SF): Building was surveyed on October 6, 2023 and samples of joint compound, floor tiles and exterior stucco were collected. No asbestos was detected in the samples (D1084). No ACM identified for the building. A tractor shed just to the north of the recreation center had original materials (OSB) dated 2010 so no samples were collected. Refer to Photo 29 to 30.

New Bothwell Canteen (2013, 1400 SF): Building was surveyed on October 6, 2023. No suspect ACM based on age of construction and type of building. No ACM identified for the building. Photo 31.

Mitchell

Mitchell Arena (1978, 25,400 SF): Building was surveyed on September 22, 2023. Samples of joint compound, plaster and flooring were collected (D920). Refer to Photo 32 to 40.

Floor tiles (12”) in different areas were found to contain 1% - 5% chrysotile asbestos. The 12” beige floor tiles in the entrance and storage rooms near the entrance and the 12” grey floor tiles in the electrical/storage room were found to contain asbestos.

The plaster walls in the viewing area for the rink was found to contain 1% - 5% chrysotile asbestos. None of the joint compound samples contained asbestos. The attic space is insulated with fiberglass.

A small amount of vermiculite was noted in the basement utility space, and will be used as fill the void space of cinder block walls used for the building (Photo 40). Vermiculite is presumed to contain small amounts of amphibole (actinolite/tremolite) asbestos present as a contaminant. Samples were not collected.

Mitchell Recreation Centre (1991, 8200 SF): Building is next to the arena. A sample of the flooring present in the kitchen area was collected and no asbestos was detected. No ACM identified for the building. Photo 41.

Mitchell Stahn Field Canteen and Garage (1997, 3150 SF): Canteen building has a canteen and washrooms, with a more garage addition. Plywood on interior of metal clad building. Any drywall is unfinished in garage space. No suspect materials identified, and no samples collected. No ACM identified for the building. Refer to Phot 45 and 46.

Mitchell Park Canteen and Washrooms (1975, 370 SF/415 SF): Canteen building and washrooms within the Mitchell Park near to the arena building. Plywood on interior of metal clad building. No suspect materials identified, and no samples collected. No ACM identified for the buildings. Refer to Photo 42 to 44.

Mitchell Public Works Building (2009/2021): Building is newer. No suspect materials identified in limited survey, and no samples collected. No ACM identified for the building.

Blumenort

Blumenort Recreation Centre (1982, 3,200 SF): Building was surveyed on October 17, 2023. Building is located within AG Penner Park. Samples of joint compound and exterior stucco were collected; no asbestos detected (D1146). Refer to Photos 47 to 49.

The older thick black flooring (12” wide planks) in the storage area was sampled and found to contain 10% - 25% chrysotile asbestos. Flooring is non-friable.

Picnic Shelter (1982, 581 SF): No suspect materials identified, and no samples collected. No ACM identified. Photo 51.

Canteen/Washrooms (2022, 2500 SF): No suspect materials identified, and no samples collected. No ACM identified. Photo 52.

Lift Station (2004, 650 SF) No suspect materials identified, and no samples collected. No ACM identified. Photo 53.

Wastewater/Aeration (2005, 3000 SF) No suspect materials identified, and no samples collected. No ACM identified. Photo 54.

Photographs of the sampling locations are included in Appendix 2.

4.0 ASBESTOS INVENTORY

The following buildings have ACM identified, based on the present survey:

Mitchell Arena: For the Mitchell Arena, the cinder block walls are filled with vermiculite in some areas. The wall plaster for the rink viewing area (main floor, main area) contains asbestos. There are 12" floor tiles that were also found to contain asbestos.

Blumenort Recreation Centre: The thick black flooring which is present primarily in storage areas was found to contain asbestos, as a non-friable material.

Kleefeld Fire Hall: There is ACM joint compound present in different areas of the building, and ACM sheet flooring present in different areas as well. There is a mix of materials and newer materials are also present.

Asbestos-containing materials (ACM) were identified as follows:

Plaster: The wall plaster material for the viewing area in the Mitchell Arena was found to contain asbestos (1% -5% chrysotile). Material is non-friable.

Drywall Joint Compound: Drywall joint compound within the Kleefeld Fire Hall was found to contain asbestos (1% -5% chrysotile). Some areas of the arena contain newer drywall without ACM joint compound. Material is semi-friable.

Vermiculite: The cinder block walls in some parts of the Mitchell Arena are filled with vermiculite insulation. Vermiculite is a natural insulation product that is presumed to contain small amounts of amphibole (actinolite/tremolite) asbestos as a contaminant.

Flooring: The older thick black flooring (12" wide planks) in the Blumenort Recreation Centre Building in AG Penner Park was found to contain 10% - 25% chrysotile asbestos; this flooring is considered non-friable.

There is ACM sheet flooring present in the Kleefeld Fire Hall building, in the second floor north area (storage) and in the main fire hall space, under the stairs to the second floor. Backing material for sheet flooring is friable.

There are ACM floor tiles present in the main area and in the entrance area for the Mitchell Arena. Floor tiles are considered non-friable.

These materials should only be removed by a qualified abatement contractor.

Photographs identifying sample locations are included as Appendix 2.

Additional survey methodology information is included in Appendix 3 and definitions are included as Appendix 4.

Full laboratory results are included as Appendix 5.

5.0 GENERAL RECOMMENDATIONS

5.1. Any work to remove the friable or semi-friable asbestos-containing materials can generally be completed following Type 2 or Type 3 procedures, depending on work procedures and occupancy. An evaluation of risk should be completed based on work involved to develop appropriate safe work procedures to be followed.

5.2. Any work to remove non-friable floor tiles or thick black flooring can generally be completed following Type 1 procedures, provided only hand tools are used.

5.3. This report should be retained by the owner/employer for the building. The report may provide useful information for contractors or others seeking information related to asbestos surveys.

5.4. This report should be available onsite during any type of renovation work and workers must be aware of the presence of ACM. This report should be available onsite during asbestos abatement or removal work, and should be reviewed by the abatement contractors prior to the start of work. If any additional suspect materials not discussed within this survey report are uncovered during abatement or demolition, additional sampling may be warranted.

5.5. All abatement or removal of the asbestos-containing materials identified in this report must be handled according to the Guide for Asbestos Management (November 2020) published by Safe Work Manitoba.

5.6. The guideline and the Manitoba Workplace Safety and Health Act and Regulations contain specific provisions requiring owners, employers and contractors to take specific actions when there is a potential risk of airborne asbestos fibers.

5.7. The abatement or removal of the any presumed or confirmed ACM as identified in this report must be done in a manner that does not create a risk to the safety or health of any person (MR217/2006, Sec. 37.7).

5.8. Notification must be provided to WSH at least 5 days prior to the start of work to remove (or otherwise disturb) ACM where either Type 2 or Type 3 procedures are required. This notice applies to the demolition of any structure that contains ACM that may release fibers into the atmosphere. Any removal of friable materials would require notification to WSH.

5.9. Notice must be provided by completing an online form, which can be accessed at: http://www.gov.mb.ca/labour/safety/asbestos.html

5.10. All ACM identified in this report must be removed prior to full demolition of the building (MR217/2006, Sec. 33.4).

6.0 REGULATIONS/REFERENCES

Guide for Asbestos Management. Safe Work Manitoba. November 2020.

ASTM E2356 Standard Practice for Comprehensive Building Surveys (ASTM, 2014).

Appendix 1 – Bulk Asbestos Sampling and ACM Inventory

Grunthal Arena

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D950	01	Main	DJC - Utility/Furnace Room	Sep 26/23	none	n/a	n/a
D950	02	Main	DJC - Storage (East Exterior)	Sep 26/23	none	n/a	n/a
D950	03	Main	DJC - Storage Room (Near Door)	Sep 26/23	none	n/a	n/a
D950	04	Main	DJC - Storage/Skate Sharpening Shelf	Sep 26/23	none	n/a	n/a
D950	05	Main	Floor Tile - Corner Viewing Area	Sep 26/23	none	n/a	n/a
D950	06	Main	DJC - Kitchen	Sep 26/23	none	n/a	n/a
D950	07	Main	Flooring - East Exit Vestibule	Sep 26/23	none	n/a	n/a
D950	08	Zamboni	DJC - Zamboni Room Ceiling	Sep 26/23	none	n/a	n/a
D950	09	Zamboni	DJC - Zamboni Room Wall	Sep 26/23	none	n/a	n/a
D950	10	Utility Rooms	DJC - Room by Zamboni Room	Sep 26/23	none	n/a	n/a
D950	11	Utility Rooms	DJC - Chiller Room Wall	Sep 26/23	none	n/a	n/a
D950	12	Utility Rooms	DJC - Chiller Room Wall Corner Guard for Cut-Out	Sep 26/23	none	n/a	n/a
D950	13	Change Rooms	DJC - Change Room Ceiling, Room 1	Sep 26/23	none	n/a	n/a
D950	14	Change Rooms	DJC - Change Room Ceiling, Room 3	Sep 26/23	none	n/a	n/a
D950	15	Change Rooms	DJC - Change Room Ceiling, Room 4	Sep 26/23	none	n/a	n/a
D950	16	Change Rooms	Cement/Plaster - Change Room Showers, Room 1	Sep 26/23	none	n/a	n/a
D950	17	Change Rooms	Cement/Plaster - Change Room Showers, Room 1	Sep 26/23	none	n/a	n/a
D950	18	Change Rooms	Cement/Plaster - Change Room Showers, Room 4	Sep 26/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Grunthal Park/Pool Building

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D956	01	Interior	DJC - Canteen Ceiling	Sep 26/23	none	n/a	n/a
D956	02	Interior	DJC - Washroom Ceiling	Sep 26/23	none	n/a	n/a
D956	03	Interior	DJC - Pool Storage	Sep 26/23	none	n/a	n/a
D956	04	Exterior	Stucco (Exterior) - West	Sep 26/23	none	n/a	n/a
D956	05	Exterior	Stucco (Exterior) - North	Sep 26/23	none	n/a	n/a
D956	06	Exterior	Stucco (Exterior) - East	Sep 26/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Grunthal Soccer Shed

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D954	01	Interior	DJC - Ceiling	Sep 26/23	none	n/a	n/a
D954	02	Interior	DJC - Wall	Sep 26/23	none	n/a	n/a
D954	03	Interior	DJC – Wall Demising	Sep 26/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Kleefeld Recreation Centre Building

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1081	01	Interior	DJC - Utility	Oct 6/23	none	n/a	n/a
D1081	02	Interior	DJC – Utility Storage	Oct 6/23	none	n/a	n/a
D1081	03	Interior	DJC – Kitchen (East, Exterior)	Oct 6/23	none	n/a	n/a
D1081	04	Interior	Floor Tile (12”) Main Tile in Entrance	Oct 6/23	none	n/a	n/a
D1081	05	Exterior	Stucco (Exterior) - North	Oct 6/23	none	n/a	n/a
D1081	06	Exterior	Stucco (Exterior) - South	Oct 6/23	none	n/a	n/a
D1081	07	Exterior	Stucco (Exterior) – South-West	Oct 6/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Hanover IT Shack (Near Kleefeld, MB)

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1085	01	Interior	Floor Tile (12”) Beige	Oct 6/23	none	n/a	n/a
D1085	02	Interior	Floor Tile (Thicker, Bottom Layer)	Oct 6/23	none	n/a	n/a

Kleefeld Fire Hall

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1086	01	Main Floor	DJC - Entrance	Oct 6/23	none	n/a	n/a
D1086	02	Second Floor	DJC – Second Floor North End, East Wall	Oct 6/23	none	n/a	n/a
D1086	03	Main Floor	DJC – Stairwell South Exterior Wall	Oct 6/23	none	n/a	n/a
D1086	04	Second Floor	Sheet Flooring, Second Floor North	Oct 6/23	10% - 25% Chrysotile	Present in a small area; may be present elsewhere	Fair

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1086	05	Main Floor	DJC – Main Floor North (Storage Room)	Oct 6/23	<1% Chrysotile	Present in storage room; mix of materials present based on renovations	Fair
D1086	06	Main Floor	DJC – Fire Hall	Oct 6/23	none	n/a	n/a
D1086	07	Main Floor	DJC – Fire Hall Under Stairs	Oct 6/23	1% - 5% Chrysotile	Present in storage room; mix of materials present based on renovations	Fair
D1086	08	Main Floor	Flooring (Sheet) – Under Stairs	Oct 6/23	10% - 25% Chrysotile	Present in a small area; may be present elsewhere	Fair

DJC – Drywall Joint Compound.

New Bothwell Fire Hall

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1087	01	Main Floor	DJC - Office	Oct 6/23	none	n/a	n/a
D1087	02	Main Floor	DJC – Utility	Oct 6/23	none	n/a	n/a
D1087	03	Main Floor	DJC – Washrooms	Oct 6/23	none	n/a	n/a

New Bothwell Recreation Center

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1084	01	Garage	DJC – Garage with O/H, North	Oct 6/23	none	n/a	n/a
D1084	02	Garage	DJC – Garage with O/H, South	Oct 6/23	none	n/a	n/a
D1084	03	Garage	DJC – Garage with O/H, Ceiling	Oct 6/23	none	n/a	n/a
D1084	04	Main Area	DJC – Main Room SE	Oct 6/23	none	n/a	n/a
D1084	05	Main Area	DJC – Main Room SW	Oct 6/23	none	n/a	n/a
D1084	06	Main Area	DJC – Main Washroom	Oct 6/23	none	n/a	n/a

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1084	07	Main Area	Floor Tile 12” Beige	Oct 6/23	none	n/a	n/a
D1084	08	Exterior	Stucco	Oct 6/23	none	n/a	n/a
D1084	09	Exterior	Stucco	Oct 6/23	none	n/a	n/a
D1084	10	Exterior	Stucco	Oct 6/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Mitchell Arena

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D920	01	Main	DJC - Utility Chase by Canteen	Sep 22/23	none	n/a	n/a
D920	02	Main	DJC - Canteen Wall	Sep 22/23	none	n/a	n/a
D920	03	Main	DJC - Canteen Ceiling	Sep 22/23	none	n/a	n/a
D920	04	Main	DJC - Men's Washroom	Sep 22/23	none	n/a	n/a
D920	05	Main	DJC - Electrical/.Storage Room Wall	Sep 22/23	none	n/a	n/a
D920	06	Main	DJC - Electrical/Storage Room Around Panel	Sep 22/23	none	n/a	n/a
D920	07	Main	DJC - Electrical/Storage Room Ceiling	Sep 22/23	none	n/a	n/a
D920	08	Main	Floor Tile - 12" Grey, Electrical/Storage	Sep 22/23	1% - 5% Chrysotile	Present in main floor	Good Non-Friable
D920	09	Main	Wall Plaster - Electrical/Storage	Sep 22/23	1% - 5% Chrysotile	Present in main viewing area	Good Non-Friable
D920	10	Main	Wall Plaster - Main Viewing Area (Column)	Sep 22/23	1% - 5% Chrysotile	Present in main viewing area	Good Non-Friable
D920	11	Main	Wall Plaster - Main Viewing Area	Sep 22/23	none	n/a	n/a
D920	12	Entrance	Floor Tile - 12" Beige, Entrance	Sep 22/23	1% - 5% Chrysotile	Present in entrance area rooms	Good Non-Friable
D920	13	Entrance	Floor Tile - 12" Beige, Entrance Storage Room	Sep 22/23	1% - 5% Chrysotile	Present in entrance area rooms	Good Non-Friable

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D920	14	Entrance	DJC - Entrance Storage Room	Sep 22/23	none	n/a	n/a
D920	15	Basement	Black Flooring Panels for Basement Change Rooms	Sep 22/23	none	n/a	n/a
D920	16	Basement	DJC - Change Room 2	Sep 22/23	none	n/a	n/a
D920	17	Basement	DJC - Change Room 2 Bulkhead	Sep 22/23	none	n/a	n/a
D920	18	Basement	DJC - Basement Furnace Room	Sep 22/23	none	n/a	n/a
D920	19	Basement	DJC - Change Room 3 Bulkhead	Sep 22/23	none	n/a	n/a
D920	20	Zamboni	DJC - Zamboni Room Utility	Sep 22/23	none	n/a	n/a
D920	21	Zamboni	DJC - Zamboni Room Wall	Sep 22/23	none	n/a	n/a
D920	22	Ref Room	DJC - Ref Room	Sep 22/23	none	n/a	n/a
D920	23	Time Booth	DJC - Time Booth	Sep 22/23	none	n/a	n/a
D920	24	Rink Office	DJC - Rink Office	Sep 22/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Mitchell Recreation Centre

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D918	01	Main	Kitchen Flooring	Sep 22/23	none	n/a	n/a

Blumenort Recreation Centre (AG Penner Park)

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1146	01	Main	DJC - Utility Room	Oct 17/23	none	n/a	n/a
D1146	02	Main	DJC – Tractor Room	Oct 17/23	none	n/a	n/a
D1146	03	Main	DJC – Men’s Washroom	Oct 17/23	none	n/a	n/a

Lab Number	ID	Area/ Floor	Description/Location	Date Sampled	Asbestos Content	Amount	ACM Condition
D1146	04	Exterior	Exterior Stucco - South	Oct 17/23	none	n/a	n/a
D1146	05	Exterior	Exterior Stucco - East	Oct 17/23	none	n/a	n/a
D1146	06	Exterior	Exterior Stucco – North-West	Oct 17/23	none	n/a	n/a
D1146	07	Main	Flooring	Oct 17/23	10% - 25% Chrysotile	Present in storage room and elsewhere. Portions in main area have been replaced.	Fair Non-Friable
D1146	08	Main	DJC - Kitchen	Oct 17/23	none	n/a	n/a
D1146	09	Main	Mastic on Concrete	Oct 17/23	none	n/a	n/a

DJC – Drywall Joint Compound.

Appendix 2– Photographs

Photo 1

Photo shows exterior of Grunthal Arena Building.

No ACM were identified within the building.

September 26, 2023.

Photo 2

Photo shows location of sample 1 of the joint compound in the utility/furnace room (west).

No asbestos detected.

September 26, 2023.

Photo 3

Photo shows location of sample 2 and 4 of the joint compound in the storage room or skate sharpening room. Sample 3 of joint compound also collected in this room, near east end of the building.

No asbestos detected.

September 26, 2023.

Photo 4

Photo shows approximate location of sample 5 of the floor tiles in the corner rink viewing area.

No asbestos detected.

September 26, 2023.

Photo 5

Photo shows the Grunthal Fire Hall.

Building was reportedly built in 2010. Building was surveyed and no suspect ACM were noted based on age of construction.

September 26, 2023.

Photo 6

Photo shows the Grunthal Park Pool Building with canteen.

Building was reportedly originally built in 1967, with addition in 2007. Samples of joint compound and exterior stucco were collected and no asbestos was detected.

No ACM identified within the building.

September 26, 2023.

Photo 7

Photo shows the Grunthal Park Machine Shed Building (450 SF, 1967).

No ACM identified within the building.

September 26, 2023.

Photo 8

Photo shows the Grunthal Motocross Park Washroom Building (340 SF, 1990).

No ACM identified within the building.

September 26, 2023.

Photo 9

Photo shows the Grunthal Motocross Park Canteen Building (750 SF, 1990).

No ACM identified within the building.

September 26, 2023.

Photo 10

Photo shows the Grunthal Water Treatment Plant Building (660 SF, 1974).

No ACM identified within the building.

September 26, 2023.

Photo 11

Photo shows the Grunthal Soccer Shed Building (625 SF, 1990).

Samples of joint compound were collected, and asbestos not detected.

No ACM identified within the building.

September 26, 2023.

Photo 12

Photo shows the Hanover Public Works Building near Kleefeld, MB (21200 SF, 2015). Samples were not collected, based on age.

No ACM identified within the building.

September 26, 2023.

Photo 13

Photo shows the Kleefeld Recreation Centre building (3000 SF, 1985).

Samples of joint compound, floor tiles and exterior stucco were collected, and asbestos not detected.

No ACM identified within the building.

October 6, 2023.

Photo 14

Photo shows location of sample 1 of joint compound for the Kleefeld Recreation Centre building.

Samples of joint compound, floor tiles and exterior stucco were collected, and asbestos not detected.

No ACM identified within the building.

October 6, 2023.

Photo 15

Photo shows location of sample 4 of older predominant floor tiles for the Kleefeld Recreation Centre building.

Samples of joint compound, floor tiles and exterior stucco were collected, and asbestos not detected.

No ACM identified within the building.

October 6, 2023.

Photo 16

Photo shows the Kleefeld Park Tractor Shed building (690 SF, 1992).

Building has utility connections; no ACM were identified.

No ACM identified within the building.

October 6, 2023.

Photo 17

Photo shows the Kleefeld Park Canteen building (200 SF, 1994).

Building has utility connections; no ACM were identified. Perlite noted in cinder block void space (not ACM).

No ACM identified within the building.

October 6, 2023.

Photo 18

Photo shows the Kleefeld Park Equipment Shed (980 SF, 1972) near to the Canteen.

No ACM identified within the building.

October 6, 2023.

Photo 19

Photo shows the Hanover IT Shack (170 SF, date not clear) next to the Hanover Public Works Building.

Floor tiles were sampled.

No ACM identified within the building.

October 6, 2023.

Photo 20

Photo shows location of samples 1 and 2 of the floor tiles in the Hanover IT Shack (170 SF, date not clear) next to the Hanover Public Works Building.

Floor tiles were sampled (D1085).

No ACM identified within the building.

October 6, 2023.

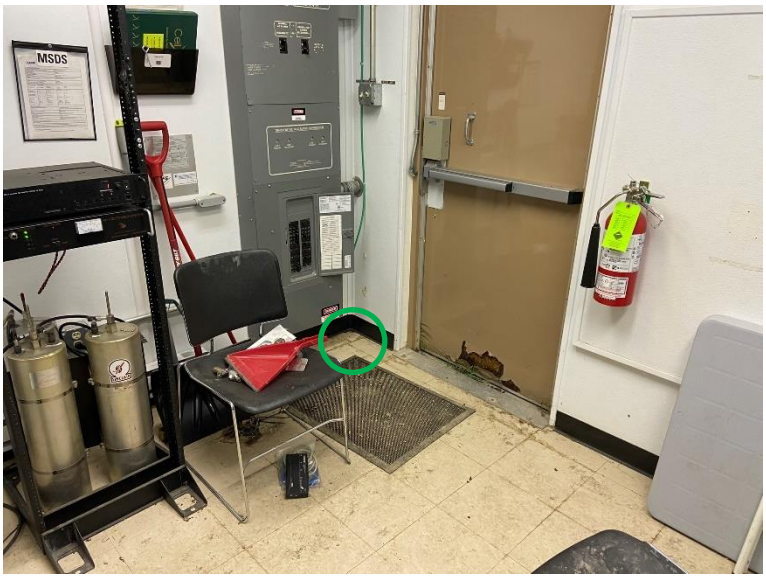

Photo 21

Photo shows the Public Works Cold Storage building near Kleefeld (7600 SF, 2015) near to the Canteen.

No ACM identified within the building. Building consists primarily of steel, wood and concrete.

October 6, 2023.

Photo 22

Photo shows the Kleefeld Fire Hall (5900 SF, 1981).

ACM were identified within the building.

Joint compound and flooring in some areas were found to contain asbestos.

October 6, 2023.

Photo 23

Photo shows location of Sample 4 for the sheet flooring present in the second floor north space used as general storage within the Kleefeld Fire Hall.

Flooring contains 10% - 25% chrysotile asbestos in the back layer.

October 6, 2023.

Photo 24

Photo shows location of Sample 5 for the joint compound present in the main floor north storage space within the Kleefeld Fire Hall.

Sample contains small amounts (<1%) of chrysotile asbestos.

October 6, 2023.

Photo 25

Photo shows location of Sample 7 for the joint compound present in the main floor fire hall space, under the stairs within the Kleefeld Fire Hall.

Sample contains 1% - 5% chrysotile asbestos.

October 6, 2023.

Photo 26

Photo shows location of Sample 8 for the older flooring material present in the main floor fire hall space, in the area under the stairs within the Kleefeld Fire Hall.

Sample contains 10% - 25% chrysotile asbestos.

October 6, 2023.

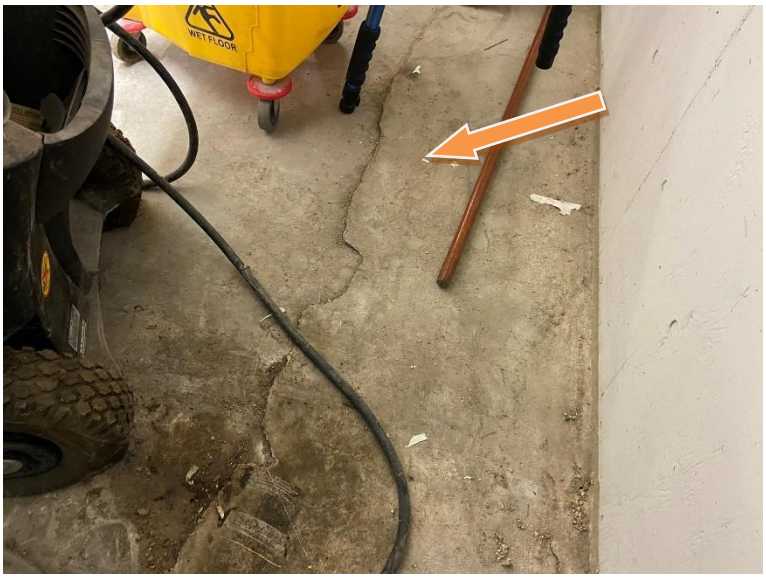

Photo 27

Photo shows the Water Treatment Plant Buillding in Kleefeld (2300 SF, 2010).

No ACM identified within the building. Building consists primarily of steel.

October 6, 2023.

Photo 28

Photo shows the Fire Hall Buillding in New Bothwell (3100 SF, 1959).

Joint compound samples were collected.

No ACM identified within the building.

October 6, 2023.

Photo 29

Photo shows the main interior space for the New Bothwell Recreation Centre Buillding (4300 SF, 1974).

Joint compound samples were collected in different parts of the building. Floor tiles were sampled. Exterior stucco for garage portion was sampled.

No ACM identified within the building.

October 6, 2023.

Photo 30

Photo shows the exterior for the garage portion of the New Bothwell Recreation Centre Buillding (4300 SF, 1974).

Exterior stucco for garage portion was sampled.

No ACM identified within the building.

October 6, 2023.

Photo 31

Photo shows the New Bothwell Canteen building (1400 SF, 2013).

No samples were collected.

No ACM identified within the building.

October 6, 2023.

Photo 32

Photo shows the Mitchell Arena building (25400 SF, 1978).

ACM were identified within the building, including the plaster wall for viewing area, floor tiles and vermiculite.

September 22, 2023.

Photo 33

Photo shows location of Samples 9, 10, 11 for the plaster wall in the main viewing area for the Mitchell Arena.

Samples contained 1% - 5% chrysotile asbestos (D920).

Joint compound collected from the canteen and other spaces in the main floor area did not contain asbestos.

September 22, 2023.

Photo 34

Photo shows location of Sample 9 for the plaster wall in the electrical/storage room (sample contained 1% - 5% chrysotile asbestos).

Photo shows location of Sample 8 for the 12" beige floor tiles in the electrical/storage room (sample contained 1% - 5% chrysotile asbestos).

September 22, 2023.

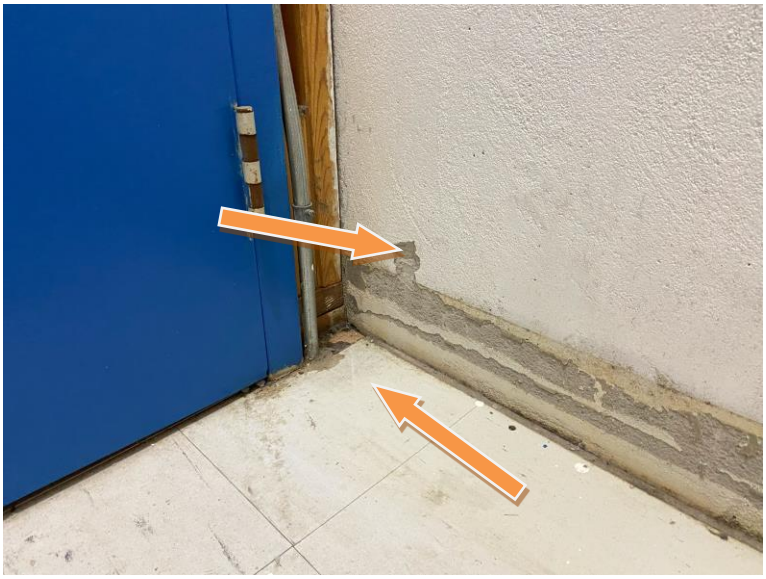

Photo 35

Photo shows location of Sample 10 for the plaster wall in the main viewing area (sample contained 1% - 5% chrysotile asbestos).

Material is concrete-like; ACM may be present as a texture coat.

September 22, 2023.

Photo 36

Photo shows the attic space above the main viewing area for the Mitchell Arena.

Fiberglass insulation is present. No suspect ACM identified.

September 22, 2023.

Photo 37

Photo shows location of Sample 12 for the 12" beige floor tiles in the entrance (sample contained 1% - 5% chrysotile asbestos).

September 22, 2023.

Photo 38

Photo shows location of Sample 13 for the 12" beige floor tiles in the entrance (sample contained 1% - 5% chrysotile asbestos).

Photo also shows location of sample 14 of joint compound; no asbestos detected.

September 22, 2023.

Photo 39

Photo shows location of Sample 18 of joint compound in the basement utility space; no asbestos detected.

Additional samples of joint compound from the basement, including change rooms were also collected and no asbestos detected.

September 22, 2023.

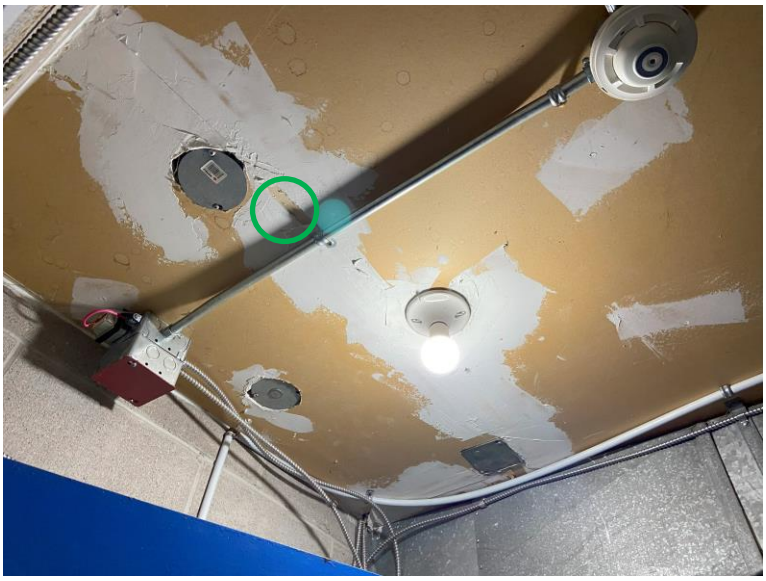

Photo 40

Photo shows small amounts of vermiculite observed in the basement utility space for the Mitchell Arena. Vermiculite is likely present within the void space of the cinder block walls. Any spills should be cleaned up.

Vermiculite is presumed to contain small amounts of amphibole asbestos.

September 22, 2023.

Photo 41

Photo shows the main space for the Mitchell Community Centre (Recreation Centre) next to the arena (8200 SF, 1991).

A sample of flooring was collected (back material present) from the kitchen storage and no asbestos detected (D918).

No ACM identified within the building.

September 22, 2023.

Photo 42

Photo shows the Mitchell Canteen near to the arena (370 SF, 1975).

No ACM identified within the building.

September 22, 2023.

Photo 43

Photo shows the Mitchell Park Washrooms near to the arena (415 SF, 1975).

No ACM identified within the building.

September 22, 2023.

Photo 44

Photo shows the Mitchell Rink shelter building (300 SF, 2000).

No ACM identified within the building.

September 22, 2023.

Photo 45

Photo shows the Maintenance Garage building with Canteen at Stahn Field (3150 SF, 1997).

Plywood used as interior finish. Any drywall unfinished. Metal clad building.

No ACM identified within the building.

September 22, 2023.

Photo 46

Photo shows the Maintenance Garage building with Canteen at Stahn Field (3150 SF, 1997).

Plywood used as interior finish. Any drywall unfinished. Metal clad building.

No ACM identified within the building.

September 22, 2023.

Photo 47

Photo shows the Blumenort Recreation Centre building (3200 SF, 1982).

Drywall joint compound, exterior stucco and flooring were sampled (D1146).

Older 12" plank flooring was identified as ACM.

October 17, 2023.

Photo 48

Photo shows the main interior space for the Blumenort Recreation Centre building (3200 SF, 1982).

Joint compound in different areas was sampled and no asbestos was detected.

October 17, 2023.

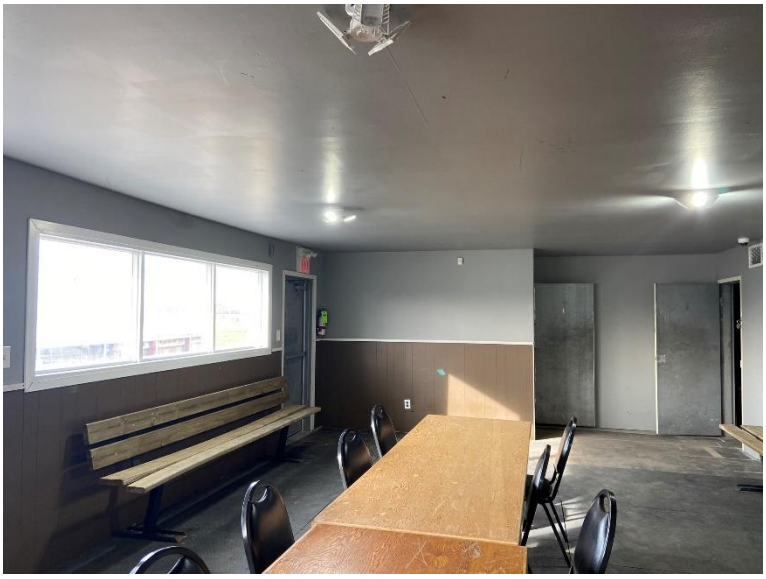

Photo 49

Photo shows the 12” thick plank flooring in the Blumenort Recreation Centre building (3200 SF, 1982). Sample 7 (D1146).

The older 12” plank flooring was identified as ACM, containing 10% - 25% chrysotile asbestos. Material is non-friable.

October 17, 2023.

Photo 50

Photo shows the Public Works Facility Garage building in Blumenort (2300 SF, 2017).

No ACM identified within the building.

October 17, 2023.

Photo 51

Photo shows the Picnic Shelter in Blumenort (580 SF, 1982).

No ACM identified within the building.

October 17, 2023.

Photo 52

Photo shows the Canteen and Washrooms Building in Blumenort (2500 SF, 2022).

No ACM identified within the building.

October 17, 2023.

Photo 53

Photo shows the Lift Station Building in Blumenort (650 SF, 2004).

No ACM identified within the building.

October 17, 2023.

Photo 54

Photo shows the Aeration Building near Blumenort (3000 SF, 2005).

No ACM identified within the building.

October 17, 2023.

Appendix 3 - Survey Methodology Information

An essential element in a hazardous materials survey is the knowledge and experience of the surveyor. The surveyor must be familiar with building materials, products and equipment that may contain hazardous substances such as asbestos, lead, PCBs and mercury.

The use of hazardous substances in building materials, products and equipment was common until the late 1970s and the use of some products and equipment containing these types of hazardous materials is likely. Building constructed prior to 1990 may contain some suspect ACMs, and materials must be evaluated prior to renovation or demolition activities.

The survey included accessible interior areas of the building, based on renovation plans in place. Not all areas of the building were surveyed and additional surveys will be required ahead of any planned renovation work in areas of the building not specifically addressed by this survey.

The survey for asbestos was completed based on guidelines in ASTM E2356 *Standard Practice for Comprehensive Building Surveys (ASTM, 2014)*. This standard describes procedures for evaluating buildings and facilities for the presence of asbestos-containing materials.

Analysis for asbestos samples was completed according to NIOSH 9002 or U.S. EPA Method 600/R-93/116, which uses polarized light microscopy (PLM) to identify the type of asbestos in bulk samples. The methodology can be used to estimate percent content for asbestos in the material analyzed. All samples were analyzed by Duracan, who are CALA-accredited.

Asbestos-containing materials may be present in inaccessible areas of the building or may be integral to the structure of the building itself. These types of materials include caulking, fire rated doors, gaskets in use on equipment, wiring or electrical components, packing associated with cast iron fittings, mastics as well as some roofing materials.

As per ASTM E2356, a baseline survey is intended to provide a general sense of the overall location, type, quantity and condition of any asbestos-containing materials present. It is thorough in that most accessible functional spaces are inspected and bulk samples taken of suspect materials observed. The intent of the survey is to provide information needed to prepare an asbestos control plan, where ACM are either confirmed through testing or presumed based on the type of material.

A baseline survey is unobtrusive in that samples are not taken when doing so would result in objectionable damage to surfaces or where institutional barriers preclude access, and destructive testing is avoided.

A pre-renovation assessment is limited in scope to the areas and materials where renovations are planned. More destructive testing is performed however not all areas of the building are evaluated. With a pre-demolition survey, all areas of the building must be evaluated and there are no restrictions on the amount or degree of destructive testing that is warranted.

Generally and unless specifically requested, sampling for a baseline survey would not be completed if sampling was hazardous to the surveyor (electrical systems), if sampling the materials would cause consequential damage to the property (window glazing), if it would affect the integrity of the system (roofing membranes), or if materials cannot be accessed without significant demolition. The potential for asbestos to be present in brake pads or similar occupant-owned inventory maintained onsite would be outside the scope of this survey. Every effort was made to complete a thorough inventory of all reasonably accessible areas, including crawlspaces, ceiling spaces, attics and similar areas where contractors would routinely access.

The conclusions, evaluations or recommendations made are made based on conditions present at the time of the evaluation. No assurance is made regarding changes in conditions subsequent to the evaluation or survey.

Based on the standard limitations inherent in any survey, MWI Consultants Inc cannot provide any assurance that all asbestos-containing materials have been identified. This survey has been undertaken and completed in a professional manner in accordance with generally accepted practices, including ASTM E2356.

Appendix 4 – Definitions/Glossary

Asbestos: Asbestos is a naturally occurring silicate mineral with long, thin fibrous crystals. The mineral was widely used in a large number of applications, particularly as a flame retardant or insulating material.

Asbestos is considered a designated material under the Controlled Products Regulations and is a known carcinogen. Chronic exposure to asbestos can lead to asbestosis and mesothelioma (a type of lung cancer), amongst others.

Asbestos has also been found in many products around the home or office, including clapboard, roofing shingles, attic insulation (vermiculite), exterior siding, pipe and boiler covering, cement, caulking, roof patching material, furnace cement, driveway coatings, wallboard, textured and latex paints, acoustical ceiling tiles, wall plaster, vinyl floor tiles, appliance wiring, hair dryers, irons and ironing board pads.

Although asbestos has caused serious health problems for workers and continues to be a risk within building maintenance, renovation, construction and demolition trades, it does not pose a significant risk for the general occupants of a building. Airborne asbestos fibers are a significant health risk.

In general, the use of asbestos has been discontinued due to the adverse health effects from inhalation of asbestos fibers.

Asbestos-Containing Material: Commonly abbreviated as ACM.

In the Province of Manitoba, a material must be considered as an ACM as follows:

- A friable material with 0.1% asbestos or greater.
- A non-friable material with 1.0% asbestos or greater.
- Vermiculite insulation that contains asbestos

Once asbestos is detected using polarized light microscopy, standard methodologies rely on a visual estimation method that cannot reliably quantify content less than 1% and so any positive result will be interpreted as meeting the definition of an asbestos-containing materials unless rigorous testing and extensive sampling is completed.

Asbestos Dust: Particles of asbestos or settled particles of asbestos which may become airborne in the workplace.

Friable Material: A material that when dry can be crumbled, crushed or powdered by hand pressure. Examples would include pipe wrap insulation, sprayed-on fireproofing, plaster, ceiling tiles and vermiculite.

Non-Friable Material: A material that when dry will not easily be crumbled by hand pressure. Examples of non-friable materials include vinyl asbestos floor tiles or sheets, drywall joint compound and gaskets. Non-friable materials may still generate airborne fibers if mishandled.

Designated Substance: A chemical substance that meets the criteria as a carcinogen, mutagen, respiratory sensitizer, reproductive toxin, fetotoxin or teratogen under the Controlled Products Regulations. Examples of some commonly encountered designated substances include asbestos, lead, mercury, silica, arsenic, benzene and isocyanates.

Occupational Exposure Limit (OEL): According to Part 36, section 36.5(1) (b) of the Manitoba Workplace Safety and Health Regulation 217/2006, the occupational exposure limit of a designated material must be as close to zero as is reasonably practicable, but shall not exceed the Threshold Limit Value (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH).

In Manitoba, the Workplace Safety and Health Regulation adopts the current ACGIH TLVs as the allowable OEL for those chemical and biological substances where a TLV exists. The current TLV for all forms of asbestos is 0.1 fibers per cubic centimeter of air (f/cc or f/cm^3).

Following asbestos abatement activities, airborne asbestos fiber concentrations must be reduced to a maximum concentration of 0.01 f/cc of air for all forms of asbestos before the negative pressure enclosure is removed and workers and others are allowed to reoccupy an area where asbestos has been removed.

Threshold Limit Value-Time-Weighted Average (TLV-TWA): The TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect. The TLVs established by ACGIH do not take into account individual sensitivities, pre-existing conditions or other health factors, such as cigarette smoking.

Appendix 5 – Laboratory Results

D918 – Mitchell Recreation Centre	(2 pages)
D920 – Mitchell Arena	(6 pages)
D950 – Grunthal Arena	(5 pages)
D954 – Grunthal Soccer Shed	(2 pages)
D956 – Grunthal Park Pool Building	(3 pages)
D1081 - Kleefeld Rec Centre	(3 pages)
D1084 - New Bothwell Rec Centre	(3 pages)
D1085 - Hanover IT Shack	(2 pages)
D1086 - Kleefeld Fire Hall	(3 pages)
D1087 - New Bothwell Fire Hall	(2 pages)
D1146 - Blumenort Recreation Centre	(3 pages)

Full laboratory results are appended to the report as separate attachments.

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Bulk Asbestos Testing Report

Report Date: *September 26, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Mitchell Rec Centre*

Work Order Number: *D918*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

Duracan Ltd
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Winnipeg, MB
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(204) 960-9995

Work Order Number	D918

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	26-Sep-23
Non Asbestos:	Filler	**100%**	1	%	26-Sep-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	26-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	26-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Sheet Flooring - Kitchen Storage					

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Bulk Asbestos Testing Report

Report Date: *September 29, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Mitchell Arena*

Work Order Number: *D920*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

Duracan Ltd
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Work Order Number	D920

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	29-Sep-23
Non Asbestos:	Filler	**100%**	1	%	29-Sep-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility Chase by Canteen					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Canteen Wall					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Canteen Ceiling					
Sample Number:	-4				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Men's Washroom					
Sample Number:	-5				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Electrical/Storage Room Wall					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Electrical/Storage Room Around Panel					
Sample Number:	-7				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Electrical/Storage Room Ceiling					
Sample Number:	-8				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	29-Sep-23
Sample Comments:	Sample Contains Asbestos				
12" Grey. Electrical/Storage					
Sample Number:	-9				
Sample Description:	Plaster				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	29-Sep-23
Sample Comments:	Sample Contains Asbestos				
Electrical/Storage					
Sample Number:	-10				
Sample Description:	Plaster				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	29-Sep-23
Sample Comments:	Sample Contains Asbestos				
Main Viewing Area (Column)					
Sample Number:	-11				
Sample Description:	Plaster				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Main Viewing Area					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-12				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	29-Sep-23
Sample Comments:	Sample Contains Asbestos				
12" Beige, Entrance Storage Room					
Sample Number:	-13				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	29-Sep-23
Sample Comments:	Sample Contains Asbestos				
12" Beige, Entrance Storage Room					
Sample Number:	-14				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Entrance Storage Room					
Sample Number:	-15				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Black Flooring Panels for Basement Change Rooms					
Sample Number:	-16				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room 2					
Sample Number:	-17				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room 2 Bulkhead					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-18				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Basement Furnace Room					
Sample Number:	-19				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room 3 Bulkhead					
Sample Number:	-20				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Zamboni Room Utility					
Sample Number:	-21				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Zamboni Room Wall					
Sample Number:	-22				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Ref Room					
Sample Number:	-23				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Time Booth					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-24				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	29-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	29-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Rink Office					

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Bulk Asbestos Testing Report

Report Date: *September 28, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Grunthal Arena*

Work Order Number: *D950*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

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The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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862 Dufferin Ave
Winnipeg, MB
R2X 0A3
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Work Order Number	D950

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	28-Sep-23
Non Asbestos:	Filler	**100%**	1	%	28-Sep-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility/Furnace Room					
Sample Number:	-2				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Storage (East Exterior)					
Sample Number:	-3				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Storage Room (Near Door)					
Sample Number:	-4				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Storage/Skate Sharpening Shelf					
Sample Number:	-5				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Corner Viewing Area					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Kitchen					
Sample Number:	-7				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
East Exit Vestibule					
Sample Number:	-8				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Zamboni Room Ceiling					
Sample Number:	-9				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Zamboni Room Wall					
Sample Number:	-10				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Room by Zamboni Room					
Sample Number:	-11				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Chiller Room Wall					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-12				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Chiller Room Wall Corner Guard for Cut-Out					
Sample Number:	-13				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Ceiling, Room 1					
Sample Number:	-14				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Ceiling, Room 3					
Sample Number:	-15				
Sample Description:	Drywall				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Ceiling, Room 4					
Sample Number:	-16				
Sample Description:	Concrete/Cement				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Showers, Room 1					
Sample Number:	-17				
Sample Description:	Concrete/Cement				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Showers, Room 1					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-18				
Sample Description:	Concrete/Cement				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Change Room Showers, Room 4					

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Bulk Asbestos Testing Report

Report Date: *September 28, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Grunthal Soccer Shed*

Work Order Number: *D954*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D954

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	28-Sep-23
Non Asbestos:	Filler	**100%**	1	%	28-Sep-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Ceiling					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Wall					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Wall at Ceiling (Partial Remaining Demising)					

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Bulk Asbestos Testing Report

Report Date: *September 28, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Grunthal Park Pool Building*

Work Order Number: *D956*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D956

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	28-Sep-23
Non Asbestos:	Filler	**100%**	1	%	28-Sep-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Canteen Ceiling					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Washroom Ceiling					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Pool Storage					
Sample Number:	-4				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco (Exterior) West					
Sample Number:	-5				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco (Exterior) North					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	28-Sep-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	28-Sep-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco (Exterior) East					

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Bulk Asbestos Testing Report

Report Date: *October 17, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Kleefeld Rec Centre*

Work Order Number: *D1081*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D1081

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	16-Oct-23
Non Asbestos:	Filler	**100%**	1	%	16-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility/Storage					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Kitchen (East Exterior)					
Sample Number:	-4				
Sample Description:	Flooring Tile				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
12" Main Tile in Entrance					
Sample Number:	-5				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco North					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco South					
Sample Number:	-7				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco South West					

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Bulk Asbestos Testing Report

Report Date: *October 17, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *New Bothwell Rec Centre*

Work Order Number: *D1084*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D1084

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	16-Oct-23
Non Asbestos:	Filler	**100%**	1	%	16-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Garage Space North					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Garage Space North					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Garage Space North					
Sample Number:	-4				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Main Room SE					
Sample Number:	-5				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Main Room SW					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Women's Washroom					
Sample Number:	-7				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
12" Beige					
Sample Number:	-8				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco					
Sample Number:	-9				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco					
Sample Number:	-10				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stucco					

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Bulk Asbestos Testing Report

Report Date: *October 17, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Hanover IT Shack*

Work Order Number: *D1085*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	**D1085**

Sample Identification		**Result**	**LOD**	**Units**	**Analyzed**
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	16-Oct-23
Non Asbestos:	Filler	**100%**	1	%	16-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
12" Beige Floor Tile					
Sample Number:	-2				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Floor Tile (Thicker, Bottom Layer)					

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Bulk Asbestos Testing Report

Report Date: *October 17, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Kleefeld Fire Hall*

Work Order Number: *D1086*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D1086

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	16-Oct-23
Non Asbestos:	Filler	**100%**	1	%	16-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Entrance at Stairwell					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
2nd Floor North End, East Wall					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Stairwell South Exterior					
Sample Number:	-4				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**10-25%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	16-Oct-23
Sample Comments:	Sample Contains Asbestos				
Second Floor North					
Sample Number:	-5				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**Traces**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Sample Contains Asbestos				
Storage Room (Main, North)					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Fire Hall					
Sample Number:	-7				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**1-5%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	16-Oct-23
Sample Comments:	Sample Contains Asbestos				
Hall Under Stairwell					
Sample Number:	-8				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**10-25%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	16-Oct-23
Sample Comments:	Sample Contains Asbestos				
Flooring Under Stairs					

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Bulk Asbestos Testing Report

Report Date: *October 17, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *New Bothwell Fire Hall*

Work Order Number: *D1087*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99%

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	**D1087**

Sample Identification		**Result**	**LOD**	**Units**	**Analyzed**
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	16-Oct-23
Non Asbestos:	Filler	**100%**	1	%	16-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Office					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	16-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	16-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Washrooms					

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Bulk Asbestos Testing Report

Report Date: *October 20, 2023*

Customer Name: *MWI Consultants - MWIC040523*

Sample Address: *Blumenort Recreation Centre*

Work Order Number: *D1146*

Reviewed by:
Shannon Ens
Laboratory Manager

QUALITY CONTROL MEASURES

Quality Control	Frequency	Passing Indicator
Method Blank	One per batch	N/A
Batch Sample	Duplicate 10% of samples	Matching result of duplicated sample
Reference Material	One per batch	Matching result of known value

N/A indicates the method blank did not show any fibre contamination. <1% indicates that no fibres were observed during analysis and may require TEM from a sourced company of the client's choice. Our test method is semi-quantitative and we report ranges above 1% such as:

1-5%, 5-10%, 10-25%, 25-50%, 50-75% and 75-99% (otherwise if <1% is observed it is noted at Traces)

All Refractive Indexes used were determined by "Rapidly and Accurately Determining Refractive Indices of Asbestos Fibers by using Dispersion Staining Method by S-C. Su..
Refractive Index Lot # used during analysis:

RI 1.550 : 0922 RI-1550-4 RI 1.605: 0922 RI-1605-2 RI 1.680: 0822 RI-1680-2 RI 1.630: 1022 RI-1630-1

The quality of samples are out of the control of the laboratory and the samples are analyzed as received. The quality of the samples are not in the laboratory control and received in the quality of which the client submits them. Sample quality and quantity must be efficient otherwise validy of results could be affected. The laboratory is not responsible for the quality or quantity of the samples which have been submitted. We are not legally responsible for results of any samples after analysis or what situations may arise after analysis. All samples are tested with the current approved method as per NIOSH 9002. Samples are only retained for 30 days and after the 30 day period, they are disposed of safely.

Method of Analysis:
Bulk Asbestos Testing by PLM
All Laboratory analyses are tested in accordance with the below validated methods which were verified in house:
EPA/600/R-93/116 July 1993 Method for the Determination of Asbestos in Bulk Building Materials

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Work Order Number	D1146

Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	Blank				
Sample Description:	Quality Control				
Sampled by:					
Matrix:	Bulk				
Bulk Asbestos Content					
Asbestos:		**N/A**	1	%	23-Oct-23
Non Asbestos:	Filler	**100%**	1	%	23-Oct-23
Sample Comments:					
Quality Control Blank					
Sample Number:	-1				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Utility Room					
Sample Number:	-2				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Zamboni Room					
Sample Number:	-3				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Men's Washroom					
Sample Number:	-4				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
South					
Sample Number:	-5				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
East					

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Sample Identification		Result	LOD	Units	Analyzed
Sample Number:	-6				
Sample Description:	Stucco				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
North-West					
Sample Number:	-7				
Sample Description:	Flooring				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:	Chrysotile	**10-25%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**75-99%**	1	%	23-Oct-23
Sample Comments:	Sample Contains Asbestos				
Hard Rubber Mat Flooring					
Sample Number:	-8				
Sample Description:	Drywall Joint Compound				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Kitchen					
Sample Number:	-9				
Sample Description:	Mastic				
Sampled by:	MWI Consultants - MWIC040523				
Matrix:	Bulk (PLM)				
Bulk Asbestos Content					
Asbestos:		**<1%**	1	%	23-Oct-23
Non Asbestos:	Non-Asbestos Material	**100%**	1	%	23-Oct-23
Sample Comments:	Asbestos Not Detected by PLM as the LOD is <1%				
Mastic for Floor Tiles/Flooring					

1.1 PROJECT

.1 Project: Grunthal Arena Expansion

.2 Location: Grunthal, Manitoba

.3 Owner: RM of Hanover

1.2 FORM OF AGREEMENT AND GENERAL CONDIONS OF THE CONTRACT

.1 The Agreement between the Owner and Contractor and the General Conditions of the Contract for the project identified in Article 1.1 above shall be the latest editions of the Standard Construction Document CCDC2 – Stipulated Price Contract and as modified by Supplementary Conditions

1.3 SUPPLEMENTARY CONDITIONS

.1 Refer to Section 00 73 00 – Supplementary Conditions

END OF SECTION

1.1 SUPPLEMENTARY CONDITIONS

.1 The following supplements modify, change, delete from or add to the General Conditions, Canadian Standard Construction Document CCDC-2 – Stipulated Price Contract– for Services and Construction, consisting of:

.1 Agreement Between Owner and General Contractor – for Services and Construction, and

.2 Schedules to the Agreement, and

.3 Definitions, and

.4 General Conditions.

.2 Where any Article or General Condition is modified or any Paragraph, Sub-Paragraph, Clause or Sentence thereof is modified or deleted by these supplements, the unaltered provisions of that Paragraph, Sub-Paragraph, Clause or Sentence shall remain in effect.

1.2 DEFINITIONS

.1 Definition "Owner", add the following:

"*Owner* shall mean RM of Hanover*."*

.2 Definition "Contractor," add the following:

"Wherever in these *Contract Documents* the word Contractor is used it shall mean the *Bidder* and vice versa."

1.3 GC 1.1 - CONTRACT DOCUMENTS

.1 Paragraph 1.1.6: revise this paragraph on Precedence of Documents, as follows: "1.1.6 If there is a conflict within the *Contract Documents,* the order of priority of documents, from highest to lowest, shall be:

.1 The Agreement between the *Owner* and *Contractor* (including the Schedules to the Agreement),

.2 The Definitions,

.2 Supplementary Conditions, if any

.3 The General Conditions,

.4 Division 01 of the *Specifications*,

.5 Technical *Specifications*:

Sections of Divisions 02 through 49 of the *Specifications*, and

Specifications as annotated on drawings.

.6 Schedules and keynotes:

Schedules within the *Specifications*, then

Schedules on Drawings.

.7 Drawings:

Drawings of larger scale shall govern over those of smaller scale of the same date, then

Dimensions shown on drawings shall govern over dimensions scaled from drawings, then

Location of utility outlets indicated on architectural detail drawings takes precedence over positions or mounting heights located on mechanical or electrical drawings.

.8 Later dated documents shall govern over earlier documents of the same type.

.9 In the event of conflict between documents, the decision of the *Consultant* shall be final.

.10 The requirements stated in Division 01 specification sections apply to all other specification sections within Division 02 to 49. Refer to precedence statements above."

1.4 GC 3.10 - SHOP DRAWINGS

.1 Add new Paragraph 3.10.13:

"3.10.13 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the *Contract Documents*."

1.5 GC 5.3 - PROGRESS PAYMENT FOR THE SERVICES

.1 Paragraph 5.3.1: change "no later than 20 calendar days" to read "no later than 20 *Working Days*".

1.6 GC 5.4 - PROGRESS PAYMENT FOR THE WORK

.1 Paragraph 5.4.7.2: change "no later than 10 calendar days" to read "no later than 10 *Working Days*".

1.7 GC 5.8 - FINAL PAYMENT FOR THE WORK

.1 Paragraph 5.8.2: change "no later than 10 calendar days" to read "no later than 10 *Working Days*".

.2 Paragraph 5.8.4: change "no later than 5 calendar days" to read "no later than 5 *Working Days"*.

1.8 GC 6.2 - CHANGE ORDER

.1 Paragraph 6.2.1 delete only that portion which reads "a method of adjustment or".

.2 Paragraph 6.2.2: delete only that portion which reads "or a method to be used to determine the adjustments".

.3 Add new Paragraph 6.2.4

"6.2.4 The valuation of proposed changes in the *Contract Price* shall be determined

either by estimate and acceptance in a lump sum, or by cost and a fixed or percentage fee. The valuation shall be in accordance with the following:

.1 Costs: The valuation of changes shall be those as defined in Article A-7 Cost of the Work of the Agreement.

.2 Mark-Ups: costs for increases in the *Contract Price*, unless otherwise agreed, shall be marked up as follows for overhead and profit (overhead and profit shall also include, but not be limited to, cost associated with office costs, estimating, IT costs, clean-up, as-built documents, safety, additional supervision costs, and costs associated with additional bonding and insurance):

(1) *Contractor*: 5 % overhead and 5% fee on the cost of his own *Work*, and 5% overhead and 5% fee on *Subcontractors'* prices.

(2) *Subcontractors*: 5% overhead and 5% fee on the cost of their own *Work*, and 5% overhead and 5% fee on Sub-subcontractors' prices.

(3) Sub-subcontractors: same rates as for *Subcontractors*.

.3 Decreases: credits for decreases in the *Contract Price* may not be marked up.

.4 Substantiation: for all changes, the *Contactor* shall submit details of the quantities, prices and fees as outlined above, together with substantiating documentation.

.5 Time for Submission and Acceptance of Quotation: the *Contractor* will cooperate in the pricing of the change to submit his quotation within twenty-one (21) days of the *Consultant's* request, and the quotation shall remain open for acceptance for thirty (30) days from the date of submission.

.6 *Value Added Taxes* (GST) shall not be considered a cost to the *Contract.* Therefore, overhead and profit shall not be applied to *Value Added Taxes.* Quotation for changes to the *Contract Price* shall not indicate any amount for the *Value Added Taxes. Value Added Taxes* shall be shown as a separate line item on Progress Payments only."

1.9 GC 6.3 – CHANGE DIRECTIVE

.1 Paragraph 6.3.2, add the following:

"The allowance for overhead and profit shall be as defined in Paragraph 6.2.4 of these General Conditions. The *Contractor* shall provide the *Consultant* with an upset limit estimate within 2 *Working Days* of the request, if so requested by the *Consultant*."

1.10 GC 6.4 – CONCEALED OR UNKNOWN CONDITIONS

.1 Add new Paragraph 6.4.5 as follows:

" 6.4.5 In consideration of the provision of the soils information and reports to the

Contractor, it is hereby expressly agreed that no *Consultant* shall in any circumstance whatsoever be under any liability whatsoever to the *Contractor* for any loss, damage or expenses of whatever nature or kind arising or resulting directly or indirectly from the provision of geotechnical information or reports for the project. Without limiting the generality of the foregoing, every exempting of liability, defense and immunity applicable to the *Owner* or to which the *Owner* is entitled hereunder shall also be available and shall extend to protect the *Consultant* rendering professional services and with respect to the provision of the soils information and this disclaimer of liability in favour of the *Consultant*, the *Owner* shall be deemed to be acting as agent or trust on behalf of and for the benefit of the *Consultant*."

1.11 CG 9.4 - CONSTRUCTION SAFETY

.1 Delete Paragraph 9.4.1 and replace with the following new paragraph

"9.4.1 The *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for:

.1 Compliance with the rules, regulations and practices required by the application construction health and safety legislation including acting as the prime contractor for all purposes under The Workplace Health and Safety Act of Manitoba, and

.2 Establishing, initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*."

1.12 GC 10.1 - TAXES AND DUTIES

.1 Paragraph 10.1.1, add the following:

"The *Contractor* shall indicate on each application for payment, as a separate item, the appropriate amount of Goods and Services Tax the *Owner* is legally obligated to pay. This amount will be paid to the *Contractor* in addition to the amount certified for payment under the *Contract*, and will therefore not affect the *Contract Price*."

.2 Add new Paragraph 10.1.2:

"10.1.2 Where a tax or duty is changed after award of *Contract*, but is publicly announced before the time of the bid closing, the change shall be deemed to have occurred before the time of the bid closing and there shall be no change to the *Contract Price*."

.3 Add new Paragraph 10.1.3:

"10.1.3 The *Contract Price* shall include the Provincial Sales Tax (PST/RST) payable for *Work* under the Retail Sales Tax Act, Manitoba."

1.13 GC 10.2 - LAWS, NOTICES, PERMITS AND FEES

.1 Paragraph 10.2.3, add the following:

"The *Contractor* shall be responsible for applying for and obtaining the Occupancy Permit when the *Work*, or any portion of the *Work*, is accepted for occupancy. The *Contractor* shall provide to the authorities having jurisdiction all required documentation for provision of the Occupancy Permit. This shall include, but not

necessarily be limited to, structural shop drawings, piling certificates, design drawings, Surveyor's Building Location Certificates, and Mechanical and Electrical test reports and verifications.

The *Contractor* shall be responsible for obtaining and paying for the Surveyor's Building Location Certificate verifying that the building is properly located on the Site and the main floor elevation is as indicated on the *Drawings*."

1.14 GC 11.1 - INSURANCE

.1 GC 11.1.1.1 – Delete paragraph 11.1.1.1 in its entirety and replace it with the following:

".1 Wrap-Up Liability insurance in the joint names of the *Contractor*, the *Owner*, the *Consultant* and all *Subcontractors* and sub consultants involved with the *Work* with limits of not less than $10,000,000 per occurrence and a deductible not more than $10,000. The insurance coverage shall be primary to all other insurance policies and shall not be substantially less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320, except for liability arising from damage to the *Project* during construction, which shall be limited to the completed operations period. The insurance shall be maintained from the date of commencement of the *Work* until 90 calendar days after the date of *Ready-for-Takeover*. The policy must provide coverage for completed operations hazards from the date of *Ready-for-Takeover* on an ongoing basis for a period of 2 years following *Ready-for-Takeover*."

.2 GC 11.1.1.9 – Add new paragraph 11.1.1.9 as follows:

".9 Where applicable, the *Contractor* shall ensure that all *Consultants,* architects or engineers engaged by the *Contractor* to provide professional services in connection with the *Work* carry professional liability insurance with limits of not less than $2,000,000 per claim, unless specified otherwise in the *Contract Documents*. Such insurance shall provide coverage for acts errors and omissions arising from their professional services performed under this *Contract*. The policy shall be maintained continuously from the commencement of the *Work* until 2 years after the date of *Ready-for-Takeover*."

.3 GC 11.1.2 – Delete paragraph 11.1.2 in its entirety and replace it with the following:

"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 in the form of a certificate of insurance 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*. Where the *Owner* is required to be named in paragraph 11.1.1, its Ministers, officers, employees and agents must also be named. The *Contractor* is responsible to ensure that all of its *Subcontractors*, consultants and subconsultants performing the *Work* maintain adequate insurance coverage. The above insurance requirements are minimum requirements. It is the responsibility of the *Contractor* and its insurance advisors to ensure that the *Contractor* purchases insurance coverage that adequately protects the *Contractor* and its property."

.4 GC 11.1.3 – Delete paragraph 11.1.3 in its entirety and replace it with the following:

"11.1.3 The *Contractor* shall be responsible for deductible amounts under the policies, except where such amounts may be excluded by the terms of the *Contract*."

.5 GC 11.1.4 – Revise the first sentence of paragraph 111.4 as follows:

"If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right, but is under no obligation, to provide and maintain such insurance and give evidence to the *Contractor* and the *Consultant*."

.6 GC 11.1.5 – Add the following wording to the end of paragraph 11.1.5:

"… and have an A.M. Best rating of A- or better (or equivalent rating agency)."

.7 GC 11.1.9 – Add new paragraph 11.1.9 as follows:

"11.1.9 In the event of an incident, occurrence or loss that may result in a claim under any of the above policies, including injuries to the public, or loss or damage to the *Work*, the *Contractor* shall immediately report the incident, occurrence or loss in writing to the *Owner* and the *Consultant*.

1.15 GC 12.3 - WARRANTY

.1 GC 12.3 – Delete paragraph 12.3.1 to 12.3.6 in their entirety and replace them with the following:

"12.3.1 The *Contractor* warrants that the Work will be free of any and all defects or deficiencies during the warranty period.

Warranty Period

"12.3.2 Unless specifically stated otherwise in the *Contract Documents*, the warranty period under the *Contract* is one year from the date when *Ready for-Takeover* has been attained, unless extended pursuant to paragraphs 12.3.3 or 12.3.4, in which case it shall expire when provided for under those paragraphs.

"12.3.3 If a defect or deficiency prevents the full and normal use or operation of the *Work* or any portion thereof, for purposes of calculating the warranty period, time shall be deemed to cease to elapse for the defective or deficient portion, and for any portion of the *Work* whose use or operation is prevented by such defect or deficiency, as of the date on which the defect or deficiency is observed or the use or operation is prevented and shall begin to run again when the defect or deficiency has been corrected or the *Work* may be used or operated to the satisfaction of the *Consultant*.

"12.3.4 If all outstanding defects or deficiencies have not been corrected to the satisfaction of the *Consultant* by at least 2 weeks prior to the date on which the warranty would expire except for this paragraph 12.3.4, then the *Consultant* may require the *Contractor* to extend the warranty period for a further period of 1 year for those defects or deficiencies in the *Work* identified by the *Consultant* as still outstanding and uncorrected or for any portion of the *Work* whose use or operation is prevented by such defects or deficiencies.

"12.3.5 Notwithstanding paragraph 12.3.2, if any law of Manitoba or of the jurisdiction in which the *Work* was manufactured requires, or if the manufacturer provides, a longer warranty period or a warranty which is more extensive in its nature, then the provisions

of such law or manufacturer's warranty shall apply.

Warranty Inspection

"12.3.6 Within a reasonable time before the warranty expires, the *Consultant* shall request that the *Contractor* arrange, attend at and assist the *Consultant* in carrying out an inspection of the *Work*.

"12.3.7 Where the warranty period has been extended pursuant to paragraph 12.3.4, a second inspection shall be carried out in accordance with paragraph 12.3.6 before the warranty period, as extended, expires

Warranty Work

"12.3.8 The *Consultant* shall notify the *Contractor* of observed defects or deficiencies and damage, if any, arising or resulting from such defects or deficiencies, within the warranty period

"12.3.9 The *Contractor* shall correct, to the satisfaction of the *Consultant*, all defects, deficiencies and damage identified by the *Consultant* in the manner and within the time period(s) specified in the notice.

"12.3.10 the *Contractor* disagrees with the *Consultant's* determination under paragraph 12.3.8, the *Contractor* shall nonetheless comply with paragraph 12.3.9. The *Contractor* may concurrently appeal the determination of the *Consultant* as provided for in PART 8 – DISPUTE RESOLUTION.

Acceptance of the Work

"12.3.11 The *Consultant* shall certify acceptance of the *Work* upon:

.1 The satisfactory performance of the *Work* during the warranty period.

.2 The *Contractor* having fully complied with paragraph 12.3.9; and

.3 The successful conclusion of any tests required under the *Contract.*

"12.3.12 Only certification of acceptance of the *Work* shall constitute:

.1 Acceptance of the *Work*; or

.2 Acceptance that the *Work* or any part thereof has been duly performed; or

.3 Acceptance of the accuracy of any claim of the *Contractor*.

"12.3.13 Certification of acceptance of the *Work* shall not, however, relieve the *Contractor* from their responsibilities for any breach of the *Contract* including, but not limited to defective or deficient *Work* appearing after the date of such certification.

1.16 GC 13.1 - INDEMNIFICATION

.1 GC 13.1 – Delete paragraphs 13.1.1 to 13.1.6 in their entirety and replace them with the following:

"13.1.1 The *Contractor* shall save harmless and indemnity the Owner, its Ministers, Officers, Employees and Agents against all costs, damages or expenses arising from actions, claims, demands and proceedings, by whomsoever brought, made or taken as a result of acts or omissions of the Contractor, or the contractor's Subcontractors,

employees or agents in the performance or purported performance of the work, and more particularly from:

.1 Accidental injury to or death of any person whether retained by or in the employ of the *Contractor* or not, arising directly or indirectly by reason of the performance of the *Work*, or by reason of any trespass on or damage to property;

.2 Damage to any property owned in whole or in part by the *Owner*, or which the *Owner* by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain

.3 Damage to, or trespass or encroachment upon, property owned by persons other than the *Owner*;

.4 Failure to pay and obtain a discharge of a notice of claim for lien served upon the *Owner* in accordance with the requirements of *The Builders' Liens Act* (Manitoba);

.5 Failure to pay a workers compensation assessment, or federal or provincial taxes;

.6 Unauthorized use of any design, device, material or process covered by letters patent, copyright, trademark or trade name in connection with the *Work*;

.7 Inaccuracies in any information provided to the *Owner* by the *Contractor*

"13.1.2 The Owner has the right, acting reasonably and upon notice to the *Contractor*, to settle any such action, proceeding, claim or demand and charge the *Contractor* with the amount so paid or to be paid in effecting a settlement.

"13.1.3 The *Contractor* shall pay to the *Owne*r the value of all legal fees and disbursements required to settle any such claim or to defend the *Owne*r against any such claim, action, proceeding, claim or demand notwithstanding that the settlement or defense of the said action, proceeding, claim or demand was undertaken on behalf of the *Owner* by a salaried employee of the *Owner*.

13.1.4 If the Contractor fails to make any payment required to be made to the *Owner* pursuant to paragraph 13.1.2 or 13.1.3, the *Owner* shall be entitled to deduct the amount of such payment from any payment required to be made by the *Owner* to the *Contractor* under the *Contract* or take whatever other remedies against the *Contractor* that the *Owner* may have at law."

1.17 GC 14.1 – PERFORMANCE SECURITY

"14.1.1 The *Contractor* shall provide and maintain performance security until the expiration of the warranty period in the form of:

.1 A performance bond of a company registered to conduct the business of a surety in Manitoba, in the form attached to the tender documents, in the amount of fifty percent (50%); of the *Contract Price*; and

.2 A labour and materials payment bond of a company registered to conduct the business of surety in Manitoba, in the form attached to the tender documents, in the amount of fifty percent (50%) of the *Contract Price*.

"14.1.2 The *Contractor* shall provide the *Owner* with the required performance security prior to the commencement of the *Work*, or within 14 Calendar days after the notice of award of *Contract*.

"14.1.3 A copy of the labour and material payment bond shall be posted in a conspicuous place at the *Place of the Work* for the entire duration of the *Work*.

1.18 GC 14.2 – CONTRACT LIABILITY AND DELAY RELATED TO COVID-19

"14.2.1 In signing the Contract, the Contractor agrees neither party will be liable for failure to perform any of its obligations under the *Contract*, if and to the extent its performance is prevented or delayed by a COVID-19 Event (as defined below). The occurrence of a COVID-19 Event will not release the affected party from its obligations under the *Contract* but will merely suspend the performance of any obligation so prevented or delayed during the period of continuance of the COVID-19 Event.

:14.2.2 The Party alleging a COVID-19 Event will:

.1 Immediately notify the other party of the particulars of the COVID-19 Event, including details of the nature of the event, its expected duration, and the obligations under the *Contract* that will be affected by the COVID-19 Event;

.2 Provide status reports to the other party on a timely basis; and

.3 Use reasonable efforts to mitigate the effects of the COVID-19 Event and to resume, as soon as reasonably possible, the performance of those of its obligations under the *Contract* affected by the COVID-19 Event.

"14.2.3 the party alleging COVID-19 Event will bear the burden of proving the existence of the COVID-19 Event and the consequences of such event.

"14.2.4 During a COVID-19 Event, the Owner may, in addition to other rights or remedies, do one or more of the following:

.1 The *Owner's* Project Manager may suspend the *Work* wholly or in part by written order for such period as the *Consultant* may deem necessary;

.2 If the *Contract* is or will not be completed within the time limit due to a COVID-19 Event, the *Owner's* Project Manager, on written request by the *Contractor*, may extend the time limit; and

.3 If a COVID-19 Event has a material adverse impact on the performance of the *Work* or *Project* for a period of thirty (30) consecutive days or more, the *Owner* may terminate the *Contract* upon written notice to the *Contractor*. The *Owner* will consult with the *Contractor* to discuss the *Contractor's* circumstances, concerns and potential options to continue the *Work* before exercising this right of termination.

"14.2.5 "COVID-19 Event" means the occurrence of an event caused directly by the coronavirus disease (COVID-19) pandemic that is beyond the reasonable control of a party, and that delays or prevents performance of the obligations of a party under the *Contract*, provided that the nonperforming party is without fault in causing or failing to prevent such occurrence, and such occurrence could not have been prevented or

circumvented through the use of reasonable alternative measures, health and safety plans, business continuity plans or other similar means. A COVID-19 Event does not include an event that merely renders fulfilment of a party's obligation under the *Contract* more difficult such as changes in market conditions.

1.19 GC 14.3 – CONFIDENTIALITY

"14.3.1 While this Contract is in effect, and at all times thereafter, the Contractor and any officers, employees, Subcontractors or agents of the Contractor shall:

.1 Treat as confidential all information, data, documents and materials acquired or to which access has been given in the course of, or incidental to, the performance of the *Contract*;

.2 Not disclose, or permit to be disclosed, to any person, corporation or organization such information, data, documents or materials without first obtaining written permission from the *Owner*; and

.3 Comply with any rules or directions made or given by the *Owner* with respect to safeguarding or ensuring the confidentiality of such information, data, documents or materials

1.20 GC 14.4 – CONTRACTOR NOT TO COMMUNICATE WITH MEDIA

"14.4.1 The *Contractor* shall not at any time directly or indirectly communicate with the media in relation to this *Contract* or the *Project* unless the *Contractor* has first obtained the express written authorization to do so by the *Owner*."

1.21 GC 14.5 – RECORD KEEPING, REPORTING AND AUDIT

"14.5.1 The *Contractor* shall establish and maintain all records for the proper administration and management of this *Contract* and the *Work* hereunder during the term of this *Contract* and for a further period of at least seven (7) years after its termination or expiration.

14.5.2 The *Owner* or the Auditor General of Manitoba, or any other person on behalf of the *Owner* or the Auditor General of Manitoba, and their respective directors, officers, employees and representatives may perform audits at all reasonable times while this *Contract* is in effect. The Contractor agrees all accounts and records, including but not limited to payroll records and subcontracts, relating to the *Work* or this *Contract must* be available, at all reasonable times while this *Contract* is in effect and for seven (7) years after its termination or expiry, for inspection and audit by the *Owner* and its representatives and auditors, and must be produced by the *Contractor* upon request. The *Contractor* agrees to cooperate fully in any such inspection or audit, and to promptly provide copies of and extracts from the accounts and records requested by the Owner and its representatives or auditors, and any such other information as may be reasonably requested by the *Owner*, and its representatives or auditors, from time to time

14.5.3 The Contractor agrees to provide accounts, information, records and reports relating to this *Contract* or the *Contractor*, and to ensure every *Subcontractor* and *Supplier* is also required, as a term of its contract, to provide such accounts, information,

records and reports relating to this *Contract* or to the *Subcontractor* or *Supplier*."

END OF SECTION

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises general construction of support buildings for an expansion and renovation to the existing recreation facility in Grunthal, Manitoba, Canada and further identified as the Grunthal Arena Expansion.

.1 Municipal Address: 63 Albert Street, Grunthal, Manitoba R0A 0R0

.2 The project consists of construction two areas of work:

1. Arena Expansion including locker rooms, kitchen, multipurpose room, gathering hall and arena viewing area.

.3 Coordinate Work with the RM of Hanover seasons schedule of shut down and start of season games.

.4 The Contractor will be assigned an area within the overall construction site for their use as a lay-down space for materials and equipment, site offices and trailers in coordination and approval with the RM of Hanover.

1.2 REFERENCES AND CODES

.1 Perform Work in accordance with Manitoba Building Code (MBC), National Building Code and NFPA (Spectator Arena) including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

.3 Wherever codes, standards, regulations are referenced throughout the Contract Documents they shall mean the latest editions including amendments, supplements, and revisions as of the date of bid closing.

1.3 CONTRACT METHOD

.1 Construct Work under single general contract.

.2 Relations and responsibilities between Contactor and Subcontractor and Suppliers as defined in Conditions of Contract. Assigned Subcontractor shall, in addition:

.1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Contractor is required to furnish such bonds to Consultant.

.3 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contactor is required to provide to Consultant.

1.4 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit Project construction progress schedule in accordance with Section 01 32 16.16 -

Construction Progress Schedule – Critical Path Method (CPM)] 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

.3 Sustainable Design Submittals:

.1 Construction Waste Management:

1. Submit project Waste Management Plan, Waste Reduction Workplan highlighting recycling and salvage requirements.
2. Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 50 to 75% of construction wastes recycled or salvaged.

.4 Submit site-specific and Work Plan Health and Safety Planning in accordance with Section 01 35 29.06 – Health and Safety Requirements.

1.5 DIVISION OF WORK

.1 Division of Work among Subcontractors and Suppliers is solely Contractor's responsibility. Consultant and Owner assume no responsibility to act as an arbiter to establish subcontractor limits between Sections or Divisions of the Work. Observe most recent version of Manitoba Trade Definitions.

.2 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.

.3 Co-ordinate work with other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

.4 Verify work of Project executed start of April 01, 2025 Work of this Contract.

1.6 CONSTRUCTION SCHEDULE

.1 The date for Substantial Performance of the Work for the Arena Expansion shall be the date listed in the Agreement between the Owner and the Contractor.

.2 Construct Work in phases to accommodate Owner's continued use of premises during construction.

.3 Co-ordinate Progress Schedule with Owner Occupancy during construction.

.4 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

.5 Maintain fire access/control.

.6 Protect workers and public safety.

1.7 PARTIAL OWNER OCCUPANCY

.1 Schedule and partially complete designated portions of Work, as indicated on the drawings, for Owner's temporary occupancy prior to Substantial Performance of entire Work.

.2 The Owner specifically requests the facility is to be opened for use (partial occupancy) prior to the demolition of the existing Ice Plant.

.3 Execute Certificate of Substantial Performance for Life Safety and mechanical and electrical building systems for the designated portion of Work prior to Owner occupancy. Contractor shall allow:

.1 Access for Owner personnel.

.2 Operation of HVAC and electrical systems.

.3 Plumbing including fixtures and trim.

.4 Fire and smoke detection systems.

.4 On occupancy, Owner and Operator will provide for occupied areas:

.1 Office furnishings, including telephones and computers

.2 Maintenance and cleaning

.3 Security

1.8 CONTRACTOR USE OF PREMISES

.1 Unrestricted use of the site until Substantial Performance

.2 Limited use of premises to allow

.1 Owner Occupancy

.2 Partial Owner Occupancy

.3 Work by other Contractors

.4 Public Usage

.3 Co-ordinate use of premises under direction of the Consultant.

.4 Obtain and pay for additional storage or work areas needed for operations under this Contract

.5 Refer to Section 01 51 00 – Temporary Utilities, Section 01 52 00 – Construction Facilities and Section 01 56 00 – Temporary Barriers and Enclosures, for temporary facilities, access roads and parking areas, traffic regulations and utilities.

.6 Remove or alter exiting work to prevent injury or damage to portion of existing work which remain.

.7 Repair or replace portions of existing work which have been altered during the construction operations to match existing or adjoining work, as directed by Consultant.

.8 Ensure that operational conditions of existing work at competition are the same, equal to or better than that which existed before new work started.

1.9 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each document as follows:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 List of Outstanding Shop Drawings.

.6 Change Orders.

.7 Other Modifications to Contract.

.8 Requests for Interpretation (RFI) including RFI log.

.9 Field Test Reports.

.10 Copy of Approved Work Schedule.

.11 Heath and Safety Plan and Other Safety Related Documents

.12 Other documents as specified.

1.10 BUILDING SMOKING ENVIRONMENT

.1 Comply with Provincial smoking regulations

1.11 COPYRIGHT CONTRACT DOCUMENTS

.1 Contract documents (drawings and specifications), as instruments of service are the property of the architect, the copy right in the same being reserved to Verne Reimer Architecture Incorporated. No reproductions may be made without the permission of the Architect and when made, must bear their name. All prints to be returned to the Architect.

END OF SECTION

1.1 GENERAL

.1 Refer to General Conditions.

.2 Contractor is to carry all Cash Allowances.

.3 Reference to Trade Sections or Divisions indicates where the description of work to be performed for this Cash Allowance is defined.

1.2 CASH ALLOWANCES

NOT USED

END OF SECTION

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1.1 DEFINITIONS

.1 Alternative Price: price for a substitution which is an addition or a deduction from the Base Bid Price. It may be required by the Owner or offered by the Bidder for selection at the discretion of the Owner.

.2 Itemized Price: price for Work that is included in the Base Bid Price, but is required to be itemized for information only (e.g. accounting, funding, costing). The work defined in an Itemized Price shall not be deducted from the Base Bid Price.

1.2 GENERAL

.1 Acceptance of Alternatives is at the sole discretion of the Owner.

.2 Submit complete and accurate prices for each Alternative, including overhead and profit labour and materials.

.3 Include in each Alternative costs by Work of Subcontractors whose Work is affected, including costs for modifications to their Work as may be required should the Alternative be accepted.

.4 Claims for extras to the Contract because of the acceptance of an Alternative will not be accepted.

.5 Do not include Goods and Services Tax (GST) in Alternative Prices or Itemized Prices.

1.3 ALTERNATIVE PRICES

1.4 ITEMIZED PRICES – NOT USED

1.5 SEPARATE PRICES – NOT USED

END OF SECTION

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1.1 SECTION INCLUDES

.1 Product/system substitution requests after award of Contract (after bids have closed).

.2 Use the Product Substitution Request Form appended to this section.

1.2 RELATED REQUIREMENTS

.1 Section 00 26 00 – Procurement Substitution Procedures: substitution requests before contract award (bidding period).

.2 Section 01 21 00 – Allowances: cash allowances carried by the Contractor; if any.

.3 Section 01 23 00 – Alternatives: alternative prices, separate prices; if any.

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SUBSTITUTIONS

.1 Consultant will consider requests for Substitutions only within ninety (90) days after date of Owner-Contractor Agreement.

.2 Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

.3 Should substitutions be required because of unavailability the Consultant will consider proposals to substitute specified products/materials with alternate products/materials.

.4 Substitutions are not permitted unless application has been made to and prior approval has been granted by the Consultant in writing.

.5 Only substitution requests from the Contractor will be considered. Requests from Subcontractors or suppliers will not be accepted.

.6 Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

.7 A request constitutes a representation that the Contractor:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

.2 Will provide the same warranty for the Substitution as for the specified Product.

.3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

.4 Waives claims for additional costs or time extension which may subsequently become apparent.

.5 Will reimburse Owner and Consultant for review or redesign services associated with re-approval by authorities.

.8 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

.9 Substitution Submittal Procedure:

.1 One (1) digital copy in PDF format, of each request for substitution. Limit each request to one (1) proposed substitution.

.2 Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

.3 The Consultant will notify Contractor in writing of decision to accept or reject request.

.10 Each proposal must:

.1 Include sufficient information to enable the Consultant to properly evaluate the material. Such information shall include manufacturer's product data, specifications, drawings, and other pertinent data to completely describe the substitution.

.2 Identify changes required in the Work of the Contractor, other Subcontractors and suppliers which would become necessary to accommodate the substitution.

.11 The Consultant reserves the right to accept or reject any proposal without prejudice for any reason whatsoever and reserves the right to disclose or not to disclose their reasons for such rejection.

.12 In submittal of a request for substitution it is hereby understood that the Contractor is certifying that the proposed substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the proposed work schedule.

END OF SECTION

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SECTION 012500.13

SUBSTITUTION REQUEST FORM

PROJECT: _____ **(After Contract Award)**

TO: _____

_____

NO. _____ DATE: _____

Contractor hereby requests acceptance of the following product or system as a substitution in accordance with provisions of Division 01 Section 012500 "Substitution Procedures":

1. SPECIFIED PRODUCT OR SYSTEM

Substitution request for: _____

Specification Section No.: _____Article/ Paragraph: _____

2. REASON FOR SUBSTITUTION REQUEST

SPECIFIED PRODUCT

- ☐ Is no longer available
- ☐ Is unable to meet project schedule
- ☐ Is unsuitable for the designated application
- ☐ Cannot interface with adjacent materials
- ☐ Is not compatible with adjacent materials
- ☐ Cannot provide the specified warranty
- ☐ Cannot be constructed as indicated
- ☐ Cannot be obtained due to one or more of the following:
  - ☐ Strike
  - ☐ Lockout
  - ☐ Bankruptcy of manufacturer or supplier
  - ☐ Similar occurrence (explain below)

PROPOSED PRODUCT

- ☐ Will reduce construction time
- ☐ Will result in cost savings of $ _____ to Project
- ☐ Is for supplier's convenience
- ☐ Is for subcontractor's convenience
- ☐ Other: _____

_____

3. SUPPORTING DATA

- ☐ Drawings, specifications, product data, performance data, test data, and any other necessary information to facilitate review of the Substitution Request are attached.
- ☐ Sample is attached
- ☐ Sample will be sent if requested

4. QUALITY COMPARISON

Provide all necessary side-by-side comparative data as required to facilitate review of Substitution Request:

	SPECIFIED PRODUCT	PROPOSED PRODUCT
Manufacturer:	_____	

Name / Brand: _____

Catalog No.: _____

Vendor: _____

Variations: _____

(Add Additional Sheets If Necessary)

Local Distributor or Supplier: _____

Maintenance Service Available: ☐ Yes ☐ No

Spare Parts Source: _____

Warranty: ☐ Yes ☐ No _____ Years

5. PREVIOUS INSTALLATIONS

Identification of at least three (3) similar projects on which proposed substitution was used:

PROJECT #1

Project: _____

Address: _____

_____

Architect: _____

Owner: _____

Contractor: _____

Date Installed: _____

PROJECT #2

Project: _____

Address: _____

_____

Architect: _____

Owner: _____

Contractor: _____

Date Installed: _____

PROJECT #3

Project: _____

Address: _____

_____

Architect: _____

Owner: _____

Contractor: _____

Date Installed: _____

6. EFFECT OF SUBSTITUTION

Proposed substitution affects other work or trades: ☐ No ☐ Yes (if yes, explain)

_____

_____

Proposed substitution requires dimensional revisions or redesign of architectural, structural, M-E-P, life safety, or other work:

☐ No ☐ Yes (if yes, attach data explaining revisions)

7. STATEMENT OF CONFORMANCE OF REQUEST TO CONTRACT REQUIREMENTS

Contractor and Subcontractor have investigated the proposed substitution and hereby represent that:

A. They have personally investigated the proposed substitution and believe that it is equal to or superior in all respects to specified product, except as stated above;

B. The proposed substitution is in compliance with applicable codes and ordinances;

C. The proposed substitution will provide same warranty as specified for specified product;

D. They will coordinate the incorporation of the proposed substitution into the Work, and will include modifications to the Work as required to fully integrate the substitution;

E. They have included complete cost data and implications of the substitution (attached);

F. They will pay any redesign fees incurred by the Architect or any of the Design Professional's consultants, and any special inspection costs incurred by the Owner, caused by the use of this product;

G. They waive all future claims for added cost or time to the Contract related to the substitution, or that become known after substitution is accepted.

H. The Design Professional's approval, if granted, will be based upon reliance upon data submitted and the opinion, knowledge, information, and belief of the Design Professional at the time decision is rendered and Addendum is issued; and that Design Professional's approval therefore is interim in nature and subject to reevaluation and reconsideration as additional data, materials, workmanship, and coordination with other work are observed and reviewed.

Contractor: _____
(Name of Contractor)

Date: _____ By: _____

Subcontractor: _____
(Name of Subcontractor)

Date:_____ By: _____ _____

Note: Unresponsive or incomplete requests will be rejected and returned without review.

8. DESIGN PROFESSIONAL'S REVIEW AND ACTION

- ☐ Substitution is accepted.
- ☐ Substitution is accepted, with the following comments: _____

  _____

  _____

- ☐ Resubmit Substitution Request:
  - ☐ Provide more information in the following areas: _____

    _____

    _____

  - ☐ Provide proposal indicating amount of savings / credit to Owner
  - ☐ Bidding Contractor shall sign Bidder's Statement of Conformance
  - ☐ Bidding Subcontractor shall sign Bidder's Statement of Conformance
- ☐ Substitution is not accepted:
  - ☐ Substitution Request received too late.
  - ☐ Substitution Request received directly from subcontractor or supplier.
  - ☐ Substitution Request not submitted in accordance with requirements.
  - ☐ Substitution Request Form is not properly executed.
  - ☐ Substitution Request does not indicate what item is being proposed.
  - ☐ Insufficient information submitted to facilitate proper evaluation.
  - ☐ Proposed product does not appear to comply with specified requirements.
  - ☐ Proposed product will require substantial revisions to Contract Documents.

By: _____

Date: _____

Design Professional has relied upon the information provided by the Contractor, and makes no claim as to the accuracy, completeness, or validity of such information. If an accepted substitution is later found to be not in compliance with the Contract Documents, Contractor shall provide the specified product.

9. OWNER'S REVIEW AND ACTION

- ☐ Substitution is accepted for items not involving additional costs.
- ☐ Substitution is not accepted.

By: _____
(Owner's Construction Manager)

Date: _____

END OF FORM

1.1 REQUESTS FOR INFORMATION

.1 General: immediately upon discovery of the need for interpretation of the Contract Documents, prepare and submit a Request for Information (RFI) to the Consultant in the form specified herein.

.1 Coordinate and submit RFIs in a prompt manner so as to avoid delays in the Work.

.2 Keep each RFI to one specific item only. Do not combine several items requiring interpretation into one RFI.

.3 For RFIs submitted by email include project name, RFI reference number and RFI subject in the email heading.

.2 Consultant will only consider RFIs submitted by the prime Contractor. Consultant will not accept, review, or reply to RFIs submitted by Subcontractors, Suppliers or other entities under Contract with the Contractor.

.3 Content of the RFI: Include a detailed, legible description of item needing interpretation and include the following:

.1 Project name.

.2 Project number.

.3 Date.

.4 Name of Contractor.

.5 Name of Consultant.

.6 RFI reference number, numbered sequentially starting with “001”.

.7 A subject line that briefly describes the RFI.

.8 Full description of the item requiring interpretation.

.9 References to specification Section number and title, including related Articles and Paragraphs, as appropriate.

.10 Reference drawing number and details, as appropriate.

.11 Field dimensions and conditions, as appropriate.

.12 Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Price, state the impact in the RFI.

.13 Contractor’s signature or the signature of their designated representative.

.14 Attachments:

.1 Include detail drawings, sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to describe items requiring interpretation.

.2 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached drawings and sketches.

1.2 RFI SUBMITTAL FORM

.1 Provide own RFI submittal form, acceptable to Consultant, and include all content specified in this Section.

.2 Submit RFI form and attachments as electronic files in PDF format.

1.3 NUISANCE OR REDUNDANT RFI

.1 Consultant will not respond to nor reply to the following Contractor-generated nuisance or redundant RFI's.

.1 Requests for approval of submittals.

.2 Requests for approval of substitutions.

.3 Requests for approval of Contractor's means and methods.

.4 Requests for approval of corrective actions for deficient Work.

.5 Requests for coordination information already indicated in the Contract Documents.

.6 Requests for adjustments in the Contract Time or the Contract Price.

.7 Requests for interpretation of Consultant's response on submittals.

.8 Incomplete or inaccurately prepared RFIs.

.2 Do no list nuisance and redundant RFI's in the RFI log.

1.4 CONSULTANT'S RESPONSE

.1 Consultant will review each RFI, determine action (or no action) required, and submit their reply back to the Contractor.

.2 Allow 10 Working Days for Consultant's response time for each RFI. RFIs that are received by the Consultant after 1:00 pm on Working Days will be considered as have been received on the next Working Day.

.3 Consultant's failure to reply to any RFI within the time period specified above or within a reasonable time period, as determine by the Consultant, will not be considered a reason for a delay claim by the Contractor.

.4 The Consultant may extend the response time for any RFI at their discretion. Reasons may include, but not necessarily be limited to, the following:

.1 Too many RFIs submitted on the same day or within a short time period.

.2 RFI's which require extensive review and research by the Consultant, which may include requests for additional information from other sources, the timing of which the Consultant has no control.

.3 RFIs which, in the Consultant's opinion, will have no significant impact on the construction progress schedule and therefore may be deferred for a reasonable period of time.

.5 Consultant's action may include a request for additional information, in which case Consultant's response time will be re-adjusted to the date when the additional information is received by the Consultant.

.6 If Contractor believes the Consultant's RFI response warrants a change in the Contract Time or the Contract Price, notify the Consultant in writing within 10 Working Days of receipt of the Consultant's RFI response.

1.5 CONTRACTOR'S RESPONSE

.1 On receipt of Consultant's response to an RFI:

.1 Update RFI log as specified herein.

.2 Review response and submit a reply to the Consultant within 10 Working Days of receipt of Consultant response, stating whether the Consultant's response is either acceptable or not acceptable.

.2 If Consultant's response is acceptable:

.1 Distribute the response to affected parties and proceed accordingly.

.3 If Consultant's response is considered not acceptable:

.1 Resubmit the RFI and include reason(s) for disagreement.

.2 Consultant will review and submit a reply to the Contractor within 10 Working Days of receipt of resubmittal, notwithstanding the Consultant's extension of response time as specified herein.

1.6 REQUESTS FOR INTERPRETATION (RFI) LOG

.1 Prepare, maintain, and submit a tabular log of RFIs organized by the RFI reference number.

.2 Submit RFI log with project meeting minutes.

.3 Include the following:

.1 Project name.

.2 Name and address of Contractor.

.3 Name and address of Consultant.

.4 RFI reference number including RFIs that were returned without action or withdrawn.

.5 RFI description/subject.

.6 Date the RFI was submitted.

.7 Date Consultant's response was received.

.8 Date Consultant requested additional information.

.9 Date RFI was closed.

END OF SECTION

Verne Reimer
Architecture
INCORPORATED

AGREEMENT: USE OF ELECTRONIC / DIGITAL FILES

May XX 2026
Project: Grunthal Arena Expansion
VRA File: 2024.01200

Via: email/jp

Company Requesting Files:

Description of Files: AutoCAD via Revit export

List of Files:

Purpose of File Transfer: Use of file(s) for coordination. No retransmission of the Files in any form to any third party is permitted unless authorized in writing by VRA

1. The requested electronic file(s) (the "Files") remain the property of Verne Reimer Architecture Incorporated (VRA). VRA retains all ownership and copyright of the information. VRA reserves the right to request return of the file(s) and/or request verified destruction of the files at any time, at its discretion.
2. No warranties or guarantees are made that the Files represent or reflect the complete scope of work and/or as-is condition. Any use of the electronic information for any purpose whatsoever is at the Company receiving the Files sole risk.
3. VRA makes no representation as to the compatibility of these files with your hardware or your software. We do not guarantee the readability or functionality of the provided media or electronic information by any hardware or software combination. We shall not be responsible for the accuracy, content or use of the electronic information.
4. VRA assumes no responsibility for data files supplied. Such data is being provided as a courtesy only. The Company receiving the Files and users thereof accept full responsibility for verifying the accuracy and completeness of the Files and/or the design/technical information described therein, and shall indemnify and hold VRA, its officers, employees, consultants and agents harmless from any claims or damages arising from the use of the Files. The Company receiving the files also agrees to defend VRA, using counsel satisfactory to VRA, from and against all claims, liabilities, losses, damages, judgments, awards and costs associated with any use of the electronic information, including but not limited to court costs and attorney's fees.
5. The use of Files to alter or revise the scope of work is not permitted, unless authorized by VRA.
6. In the event that drawing Files transferred electronically contain electronic copies of permits or professional seals, the Files shall be immediately returned to VRA and all copies thereof destroyed, with verification from the Company in receipt of the Files.
7. No use shall be made of the Files for any purpose other than that for which are stated above under "Purpose of File Transfer", without the express written consent of VRA.

Verne Reimer Architecture Incorporated
109-374 River Avenue, Winnipeg, Manitoba, Canada R3L 0E4 T 204.944.9272 F 204.944.9275
vernereimer.com

8. No retransmission of the Files in any form to any third party is permitted unless authorized in writing by VRA. If permission is granted, the Third Party is to be held to the same standards by the Company Requesting Files, as noted herein.
9. The above noted terms and conditions apply to the Company requesting the file(s). The terms and conditions apply to all owners, officers, employees, consultants and/or agents.

Having read and understood the above, and in consideration of Verne Reimer Architecture providing electronic file(s), the undersigned agrees to be bound by the terms hereof.

The above requested files will only be released upon receipt by Verne Reimer Architecture Incorporated (VRA) of an original of this agreement signed by a duly authorized representative of the company requesting the files. VRA reserves the right to deny any request for copies of electronic files.

_____

(Name of Company Requesting Files) **Date**

Signature of Company's Authorized Representative
(Name of Authorized Representative)

1.1 RELATED DOCUMENTS

.1 Builders' Liens Act (Manitoba).

.2 General Conditions and Supplements.

1.2 SCHEDULE OF VALUES

.1 Refer to General Conditions

.2 Submit to Consultant, Schedule of Values, at least 15 days prior to submitting first Application for Payment.

.3 Use Schedule of Values as basis for Contractor's Progress Claim.

.4 Form of submittal:

.1 Submit typewritten Schedule of Values digitally as determined at Project Start-up.

.2 Use Table of Contents of this Project Manual as basis for format for listing costs of work for Sections under all Divisions.

.3 Identify each line item with number and title as listed in Table of Contents of this Project Manual.

.5 Itemize separate line item cost for work required by each Section of this Project Manual.

.6 After review by Consultant, revise and resubmit Schedule as directed.

END OF SECTION

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1.1 MEETING LOCATION

.1 Project meetings shall be held virtually and at site office provided by Contractor as specified in Section 01 52 00 - Construction Facilities. Rotating schedule of locations to be determined at Start Up Meeting.

1.2 START-UP MEETING

.1 After award of Contract, but before start of Work, convene a start-up meeting to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of the Consultant, Owner, Contractor, major Subcontractors are to attend.

.3 Agenda:

.1 Appointment of official representatives of participants in the work.

.2 Schedules of work, progress scheduling.

.3 Schedule of submission of shop drawings, product data, samples, test reports,

.4 Schedule for provision of mock-ups and field samples.

.5 Requirements for temporary utilities, temporary barriers and controls, construction facilities, site sign and other temporary construction.

.6 Record drawings.

.7 Maintenance Manuals.

.8 Take-over procedures, acceptance, warranties.

.9 Monthly progress claims, administrative procedures, holdbacks.

.10 Commissioning.

.4 Consultant will chair start up meeting, record minutes, and distribute minutes to all attending parties within four (4) Working Days after meeting.

.5 Establish time and location of following meeting and notify all concerned parties within five (5) Working Days of meeting.

1.3 JOB PROGRESS MEETINGS

.1 After award of Contract and signing of Agreement, convene job progress meetings at regularly scheduled intervals to ensure proper coordination of the Work.

.2 Designate times and locations of meetings, and notify all parties concerned, including Subcontractors, to attend. Meetings will be held virtually. The details of these meetings will be reviewed at the initial startup meeting.

.3 Attendees for these meetings will include representatives of Subcontractors who are or will be performing work during the current and following month in the progress meetings.

.4 Distribute agendas of these meetings before such meetings to the Project Manager, Consultant(s) and Subcontractors.

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.5 General Contractor to chair meetings, record minutes, and distribute minutes to all attending parties within four working days after meetings. Provide minutes of meetings within 48 hours of each meeting and send to all participants, Project Manager and Consultant. Review the minutes of the meeting amended by the participants and submit all requested corrections within 48 hours.

.6 The agenda for each meeting will include the following:

.1 Introduce new attendees and areas of responsibility.

.2 Review minutes of previous meetings, amend minutes if necessary, and accept minutes.

.3 Review Construction Safety.

.4 Review work accomplished since previous meeting.

.5 At each meeting, display and review the status of the Critical Path activities. If they are behind schedule, describe the methods intended to be used to bring these activities back on schedule.

.6 Review corrective measures to maintain progress.

.7 Review a Two-Week Look-Ahead Scheduled submitted as specified in Section 01 32 16 Construction Progress Schedule, and last work plan for the previous period showing activities accomplished and those not completed in accordance with the prior submittal. Discuss the reasons for failure to complete the work as shown in the schedule and the methods to be implemented to complete the unfinished activities.

.8 Confirm that all related submittals have a satisfactory disposition as “Reviewed” or “Reviewed as Noted.” If the submittal is “Reviewed as Noted,” confirm that all comments have been implemented.

.9 Review outstanding rejected shop drawings if required. Indicate a date for resubmittals according to notes, terms of reference, and drawings.

.10 Review quality observations, issues, non-conformances, and employee work standards.

.11 Review coordination of utility work if necessary.

.12 Review coordination with Provincial departments if necessary.

.13 Review changed conditions, time extensions, and other relevant issues as they relate to the progress of the Work.

.14 Review the status of Contract Changes including Requests for Information, Supplemental Instructions, Proposed Change Notices, Change Orders, status of negotiations, and completed changes.

.7 Review with project team at each meeting

.1 Construction Schedule

.2 As Built Documents

.3 Submittal Log

.4 RFI Log

.5 SI Log

.6 Summary of Contract Changes

END OF SECTION

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1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 - Summary of Work: phasing and sequencing of the Work.

.2 Section 01 31 19 - Project Meetings: discussion of project scheduling.

1.2 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.

Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar Working Days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Contractor to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 Working Days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of

essence of this contract.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to Consultant within 10 Working Days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Consultant within 10 Working Days of receipt of acceptance of Master Plan.

1.5 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

.1 Refer to Section 01 11 00 – Summary of Work for specific dates for interim completion and Substantial Completion of specific components of the project and final completion.

1.6 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Consultant will review and return revised schedules within 10 Working Days.

.3 Revise impractical schedule and resubmit within 10 Working Days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.

.2 Shop Drawings, Samples.

.3 Permits.

.4 Mobilization.

.5 Excavation.

.6 Backfill.

.7 Building footings.

.8 Slab on grade.

.9 Structural Steel.

.10 Siding and Roofing.

.11 Interior Architecture (Walls, Floors and Ceiling).

.12 Plumbing.

.13 Lighting.

.14 Electrical.

.15 Piping.

.16 Controls.

.17 Heating, Ventilating, and Air Conditioning.

.18 Millwork.

.19 Fire Systems.

.20 Testing and Commissioning.

.21 Supplied equipment long delivery items.

.22 Engineer supplied equipment required dates.

1.8 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.9 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

END OF SECTION

1.1 SECTION INCLUDES

.1 Photographic documentation of:

.1 Project site during course of construction to record construction progress.

.2 Project site at final completion of the Work to record completed work.

.3 Other specific items as may be requested by Consultant.

.2 Provide photographic documentation in accordance with procedures and submission requirements specified in this Section.

1.2 DEFINITIONS

.1 Within the content of this Section the term "photograph" shall mean "digital image".

.2 Digital image is a still picture taken with a digital camera which can be viewed on a computer with photo editing/viewing software.

1.3 DIGITAL IMAGES

.1 Use digital camera with capability of producing digital images at minimum 5.0 megapixels, uncompressed, saved in *.jpeg format.

1.4 DISTRIBUTION

.1 Forward copies of digital images via email or file transfer site as later directed.

.2 Identify each batch of images with project name, date of exposure.

.3 Keep one set of photographs on site.

.4 Provide one set of photographs to Owner and Consultant.

1.5 CONSTRUCTION PROGRESS PHOTOGRAPHS

.1 Provide photographs of project site during progress of the Work to record construction progress.

.2 Allow for minimum 24 images for each set.

.3 Number of viewpoints: interior and exterior viewpoints including close ups of specific details, in locations directed by Consultant.

.4 Frequency: weekly and as may be requested by Consultant.

1.6 FINAL PHOTOGRAPHS

.1 Provide photographs of project site at final completion to record completed work.

.2 Allow for minimum 24 images.

.3 Number of viewpoints:

.1 Each side of buildings, and other exterior features.

.2 Interior of specific rooms as directed by Consultant.

.3 Close ups of specific details as directed by Consultant.

.4 Locations of viewpoints as directed by Consultant.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This section includes the processes for submitting a product or documentation that is to be used or to be utilized on the work.

1.2 ADMINISTRATIVE

.1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.

.10 Keep one reviewed copy of each submission on site

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to General Conditions.

.2 Submit shop drawings for Consultant's review.

.3 This review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of their responsibilities for errors or omissions in the shop drawings or of their responsibility for meeting all requirements of the contract documents. The Contractor is 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 sub-trades.

.4 The term “shop drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.5 Shop drawings that do not include the stamp, date, and signature of the person responsible for reviewing the shop drawings before submittal to the Consultant as, specified in General Conditions, will be rejected and returned without being examined.

.6 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of the Place of the Work where specifically requested in the specifications. Shop drawings not bearing the required Engineer’s stamp will be rejected and returned without being examined.

.7 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.8 Allow ten (10) working days for Consultant's review of each submission.

.9 Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If it is deemed that such adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with fabrication or the Work.

.10 Make changes in shop drawings that the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.

.11 Accompany submissions with transmittal letter, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor’s name and address.
- .4 Identification and quantity of each shop drawing, product data, and samples.
- .5 Other pertinent data.

.12 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor’s stamp, signed by Contractor’s authorized representative certifying approval of submissions, verification of field measurements and compliance with

Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.11 Seismic Zone information and requirements where pertinent.

.12 Signed and sealed by engineer licensed to practice in the jurisdiction of the work when required by the individual technical section.

.13 Submit one (1) digital file in PDF file format of the following submittals:

.1 Shop drawings for each requirement requested in specification sections and as the Consultant may reasonably request.

.2 Product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

.3 Test reports for requirements requested in specification Sections and as requested by Consultant.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within three years of date of contract award for project.

.4 Certificates for requirements requested in specification Sections and as requested by Consultant.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract, complete with project name.

.5 Manufacturers' instructions for requirements requested in specification Sections and as requested by Consultant.

.1 Pre-printed material describing installation of product, system or

material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.6 Manufacturer's field reports for requirements requested in specification Sections and as requested by Consultant.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.14 Delete information not applicable to project.

.15 Supplement standard information to provide details applicable to project.

.16 If upon review by the Consultant, no errors or omissions in compliance with the Contract Documents are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If, however, shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.17 No extension of Contract Time will be allow for delays in the Work which may be caused for Consultant's rejection of shop drawings.

.18 Shop drawings, which contain deviations from the Contract Documents which are not presented to the Consultant in writing, as specified in General Conditions will be rejected and returned without being examined.

.19 Contractors can be provided (upon request) from Consultant, electronic AutoCAD drawing files for the use in preparation of Shop Drawings. Form as attached to this section should be used for each request.

1.4 SAMPLES

.1 Submit for review samples for each requirement requested in specification sections and as the Consultant may request.

.2 Label samples as to identify material, manufacturer, make/model number, origin and intended use in the Work.

.3 Deliver samples prepaid to Consultant's business address or as directed.

.4 Notify the Consultant in writing, at the time of submission of deviations in samples from requirements of Contract Documents.

.5 Where colour, pattern or texture is criterion, submit full range of samples.

.6 Adjustments made on samples by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.

.7 Make changes in samples that the Consultant may require, consistent with Contract Documents.

1.5 CERTIFICATES AND TRANSCRIPTS

.1 Refer to General Conditions.

.2 Prior to commencement of the Work, provide evidence of compliance with worker's compensation legislation at the Place of the Work, including payments due thereunder.

.3 Submit transcription of insurance immediately after award of Contract.

1.6 CASH FLOW FORECAST

.1 Submit to the Consultant, immediately after award of Contract, a cash flow forecast of approximate costs of the work compiled on a monthly basis over the term of the Contract.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Manitoba

.1 The Workers Compensation Act RSM 1987 -c. W200.

.2 Province of Manitoba Occupational Health and Safety Act, 2022,.

1.3 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Consultant to review submittals and provide input.

.3 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.4 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Consultant.

.5 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.6 Submit copies of incident and accident reports.

.7 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 7 days after receipt of comments from Consultant.

.8 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

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1.4 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba.

.2 Comply with Occupational Health and Safety Regulations, 2022.

.3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.

1.11 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have working knowledge of occupational safety and health regulations.

.2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Consultant.

1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant.

.2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 01 74 21 – Construction Waste Management and Disposal.

1.2 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.3 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Consultant. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan: include:

.1 Name(s) of person(s) responsible for ensuring adherence to Environmental Protection Plan.

.2 Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from site.

.3 Name(s) and qualifications of person(s) responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by

vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.14 Pesticide treatment plan: to be included and updated, as required.

1.1 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.

1.3 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.2 Do not pump water containing suspended materials into waterways, sewer, or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m (6'-0").

.3 Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping, and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Consultant or as directed by the AHJ.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.6 NOTIFICATION

.1 Consultant will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Consultant of proposed corrective action and take such action for approval by Consultant.

.3 Consultant will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with Manitoba Building Code (MBC), National Building Code (NBC) and related NFPA (Spectator Arena) including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

.3 Wherever codes, standards, regulations are referenced throughout the Contract Documents they shall mean the latest editions including amendments, supplements and revisions as of the date of bid closing.

1.2 BUILDING SMOKING ENVIRONMENT

.1 Comply with Provincial smoking regulations.

.2 Comply with Health Code Regulations for Food & Beverage areas.

END OF SECTION

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative, and enforcement requirements.

.2 Tests and mix designs.

.3 Mock-ups.

.4 Mill tests.

.5 Equipment/system adjust and balance.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures: submission of samples to confirm product quality.

.2 Section 01 61 00 – Common Product Requirements: material and workmanship quality, reference standards.

1.3 REVIEW OF THE WORK

.1 Refer to General Conditions.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Contractor for the purpose of inspecting and/or testing portions of Work.

.2 Costs for independent inspection agencies shall be paid by Contractor.

.3 Provide equipment required for executing inspection and testing by the appointed agencies.

.4 Employment of inspection/testing agencies does not relax the responsibility to perform Work in accordance with the Contract Documents.

.5 If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defects and irregularities as advised by Consultant at no cost to the Owner. Pay costs for retesting and re-inspection.

1.5 ACCESS TO WORK

.1 Allow inspection/testing agencies access to the Work, offsite manufacturing, and fabrication plants.

.2 Cooperate to provide reasonable facilities for such access.

1.6 PROCEDURES

.1 Notify the appropriate agency and Consultant in advance of the requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing as specifically requested in specification Sections or as may be requested by Consultant. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 DEFECTIVE WORK

.1 Refer to General Conditions.

.2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re execute in accordance with Contract Documents.

.3 Make good other Contractor's work damaged by such removals or replacements promptly.

.4 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.8 REPORTS

.1 Submit four copies of inspection and test reports promptly to the Consultant.

.2 Provide copies to Subcontractor of work being inspected/tested and manufacturer/ fabricator of material being inspected/tested.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the Law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

1.10 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in the specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in locations as directed by Consultant or where specified in respective specification sections.

.3 Prepare mock-ups for Consultant review with reasonable promptness and in an orderly sequence, so as not to cause any delay in the Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, the Consultant will assist in preparing a schedule fixing the dates for

preparation.

.6 Remove mock-ups at conclusion of Work or when acceptable to Consultant, except those designated to remain a part of the finished Work.

1.11 MILL TESTS

.1 Submit mill test certificates as required of the specification Sections and as may be requested.

1.12 EQUIPMENT AND SYSTEMS

.1 Submit 4 copies of adjustment and balancing reports for mechanical, electrical systems and equipment.

END OF SECTION

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary utilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.2 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free of standing water.

.2 Do not discharge drainage water into sewers without written approval from governing authorities.

.3 Do not discharge drainage water containing silt into sewage lines.

1.3 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rates.

.4 Provide, install and maintain temporary lines and connections at own expense.

1.4 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture from condensation on surfaces.

.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10°C in areas in which construction is in progress.

.5 Ventilating:

.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result in harmful exposure

to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

.7 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

.8 Permanent heating system of building, when available:

.1 Permanent heating system of building may be used when available.

.2 If use is permitted:

.1 Be responsible for damage to heating system if use is permitted.

.2 On completion of Work for which permanent heating system is used, replace filters, replace damaged or worn components, clean equipment, service, lubricate and adjust to new condition.

.3 Pay costs for manufacturer's representative to facilitate repairs and maintenance necessary to equipment in order that manufacturer's guarantee period will commence on date of Owner's take-over, and not when temporary heating is started.

.3 Ensure Date of Substantial Performance of the Work and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.

.4 Pay costs for maintaining temporary heat, when using permanent heating system.

.9 Interior relative humidity:

.1 Protect damage to millwork, casework and other woodwork due to excessive moisture or drying by maintaining optimum moisture content of wood and optimum interior relative humidity within the ranges prescribed in Architectural Woodwork Institute /Architectural Woodwork Manufacturers Association of Canada (AWI/AWMAC), Architectural Woodwork Standards, Section 2 - Care and Maintenance.

.1 For Manitoba:

.1 Optimum moisture content of wood: 4 - 9%.

.2 Optimum interior relative humidity: 17 - 50%.

.2 Maintain optimum interior relative humidity within prescribed range

during storage, installation, and after installation for every hour of every day until Substantial Performance of the Work.

.3 Avoid uncontrolled extremes such as:

.1 Relative humidity above or below prescribed ranges.

.2 Sudden changes in the allowable relative humidity, especially when repetitive.

.4 Direct contact of moisture on wood - wipe dry immediately.

1.5 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power required during construction for temporary lighting and the operating of power tools.

.2 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of the supply required for temporary lighting and power tools is the responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone and internet hook up, lines and equipment necessary for own use and use of Consultant.

.2 Provide internet Wi-Fi service to site office and provide Consultant with password upon request.

1.7 FIRE PROTECTION

.1 Provide and maintain adequate temporary fire protection equipment during performance of Work, as required by insurance companies having jurisdiction and governing Codes, regulations and By-Laws.

.2 Burning rubbish and construction waste materials is not permitted on site.

END OF SECTION

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1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Construction signage.

1.2 REFERENCES

.1 General Conditions and Supplements.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.

1.3 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs.

1.5 HOISTING

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists and cranes shall be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Refer to General Conditions.

.2 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.3 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

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1.7 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide and maintain adequate access to project site.

.2 Build and maintain temporary roads, sidewalk crossings, ramps, and construction runways to maintain access, and snow removal during period of Work.

.3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

.4 Conform to requirements of governing authorities when required and, when necessary, make arrangements with adjacent property owners.

.5 Provide snow removal during period of Work.

1.8 CONSTRUCTION PARKING

.1 Parking on site to be coordinated with Owner’s representative.

1.9 SITE OFFICE

.1 Provide site office heated, lighted and ventilated, of sufficient size to accommodate site meetings of up to 20 persons. Furnish office with drawing lay down table, and separate table and chairs to accommodate meetings.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

.4 Offices within building:

.1 When usable space is available within the project building and if approved by the Owner, the site office may be located within the building, utilizing rooms therein.

.2 Such areas may be used contingent upon there being no delay in completion of the work and there being no damages to material or finishes.

1.10 EQUIPMENT, TOOL AND MATERIAL STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Consultant.

1.12 CONSTRUCTION SIGNAGE

.1 Signs and notices for safety and instruction shall be in both official languages of Canada. Graphic symbols shall conform to internationally recognized symbols.

.2 No other signs or advertisements, other than safety and warning signs, are permitted on site.

.3 Maintain approved signs and notices in good condition for duration of project and dispose of off the site on completion of project or earlier if directed by Consultant.

.4 General signage, other than a site sign specified above, is not permitted anywhere on site except by specific written permission by the Owner.

.5 Signs for safety purposes or for traffic flow, are permitted where appropriate.

END OF SECTION

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 HOARDING AND SITE FENCING

.1 Erect temporary site enclosure using chain link or wire mesh fencing, 2.1 m (7 ft.) high.

Maintain fence in good repair.

.2 Provide lockable truck entrance gate(s) and at least one pedestrian door conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard railings and barricades around deep excavations, open shafts, open stairwells, open edges of floors and roofs.

.2 Provide as recommended by local governing authorities.

1.5 WEATHER ENCLOSURES

.1 Provide temporary weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

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1.8 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect adjacent private and public property from damage during the performance of work.

.2 Be responsible for all damage incurred.

1.10 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during the performance of work.

.2 Provide necessary screens, covers and hoardings.

.3 Confirm locations and installation with Consultant at least 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

END OF SECTION

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Procedures for product substitution.

.3 Manufacturer's instructions.

.4 Quality of Work, coordination and fastenings.

.5 Prevention of dust and mould contamination of products and materials during delivery, storage and handling.

1.2 REFERENCES

.1 Canadian Standards Association (CSA):

.1 CAN/CSA-Z317.13, Infection Control during Construction, Renovation, and Maintenance of Health Care Facilities.

.2 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2, Stipulated Sum Contract, 2020.

.3 Within text of each specifications section, reference may be made to reference standards.

.4 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.5 If there is question as to whether any product or system is in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.

.6 Cost for such testing will be borne by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

.7 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.3 QUALITY

.1 Refer to General Conditions.

.2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of materials, equipment or articles are foreseeable, notify Consultant of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 SUBSTITUTIONS

.1 The Work is based on the materials and methods specified in the specifications.

.2 Substitutions are not permitted unless application has been made to and prior approval has been granted by the Consultant, in writing.

.3 Substitution requests during construction: comply with Section 00 25 13 – Product Substitution Procedures.

1.6 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of consultant.

.9 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

.10 Comply with CAN/CSA Z317.13 when shipping, handling and storing products susceptible to mould and dust contamination. Protect products from weather; take all precautions to prevent moisture or dust contamination.

.1 Wrap products in waterproof covers at plant or distribution centre prior to shipping.

.2 Load products in indoor facilities and ship to project site in enclosed vehicles only. Do not use flat-bed trucks exposed to the elements.

.3 Unload products at project site only during dry weather.

.4 Store products indoors in dry location, off concrete floors.

.5 Products that become damp, wet or contaminated with mould, dust and dirt shall be designated as defective work in accordance with GC 2.5 – Defective Work and replaced at no additional cost to the Contract.

1.7 TRANSPORTATION

.1 Pay the costs of transportation of products required in the performance of Work.

.2 Transportation costs of products supplied by the Owner will be paid for by Owner, unless specified otherwise. Unload, handle and store such products, unless otherwise specified.

1.8 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise indicated in the specifications, install or erect all products in accordance with manufacturer’s recommendations. Do not rely on labels or enclosures that are provided with products. Obtain instructions directly from manufacturers.

.2 Notify Consultant in writing of any conflicts between the Specifications and manufacturer's instructions so that the Consultant may establish the course of action to follow.

.3 Improper installation or erection of products due to failure in complying with these requirements authorizes the Consultant to require any removal and re-installation that may be considered necessary, at no increases in Contract Price or Contract Time.

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Enforce discipline and good order among workers.

.3 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.

.4 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.10 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Ensure Work of various Subcontractors does not conflict or create interference.

.3 Be responsible for the proper coordination and placement of openings, sleeves, and accessories.

.4 Supply all items required to be built in as and when required, together with templates, measurements and shop drawings.

.5 Ensure all workers examine the drawings and specifications covering the Work of others that may affect the performance of their own Work. Examine the Work of others and report to the Consultant, in writing, any defects, or deficiencies that may affect the Work. In the absence of any report, the Contractor shall be held to have waived all claims for damage to or defects in such Work.

.6 Ensure that components requiring foundations or openings that are required for the installation of Work is coordinated. Furnish the necessary information to the Sections concerned in ample time to permit allowance for such items. Failure to comply with this requirement does not relieve the party at fault of the cost of cutting or drilling at a later date and subsequent patching.

1.11 CONCEALMENT

.1 In finished areas, conceal pipes, ducts, and wiring in floors, walls, and ceilings, except where indicated otherwise.

.2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 LOCATION OF FIXTURES

.1 Consider the location of fixtures, outlets and other mechanical and electrical items indicated on drawings as approximate.

.2 Inform the Consultant of an impending installation. Install as directed.

1.14 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour, and finish as adjacent materials, unless otherwise indicated.

.2 Prevent electrolytic action between dissimilar metal and materials.

.3 Use non-corrosive hot dip galvanized fasteners and anchors for securing exterior Work, unless stainless steel or other material is specifically requested in the affected Specification Section.

.4 Space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Plugs of wood or any other organic material are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly, and install neatly.

.6 Fastenings, which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.15 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.16 PROTECTION OF WORK IN PROGRESS

.1 Protect Work completed or in progress.

.2 Prevent overloading of any part of the building. Do not cut, drill, or otherwise sleeve any load bearing structural member unless specifically indicated on drawings or in Specifications without written approval of the Consultant.

END OF SECTION

1.1 RELATED REQUIREMENTS

.1 Section 01 78 00 - Closeout Submittals: final surveyor's certificate.

1.2 REFERENCES

.1 Owner's identification of existing survey control points and property limits.

1.3 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Consultant.

1.4 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Consultant.

.4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.5 SURVEY REQUIREMENTS

.1 Establish at least two permanent bench marks on site, referenced to established bench marks by survey control points. Record their locations with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill placement and landscaping features.

.4 Stake slopes, berms, and swales.

.5 Establish pipe invert elevations.

.6 Stake batter boards for foundations.

.7 Establish foundation column locations and floor elevations.

.8 Establish lines and levels for mechanical and electrical work.

1.6 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.

1.7 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as

approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Consultant of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

1.8 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.9 SUBMITTALS

.1 Submit name and address of Surveyor to Consultant.

.2 On request of Consultant, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.10 SUBSURFACE CONDITIONS

.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

END OF SECTION

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.4 Remove waste materials and debris from the site at regularly scheduled times or dispose of as otherwise directed by the Consultant. Do not burn or bury waste materials or debris on site.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

1.2 MATERIALS

.1 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.3 CLEANING DURING CONSTRUCTION

.1 Provide on-site containers for collection of waste materials, and debris.

.2 Dispose of waste materials and debris off site at regularly scheduled intervals.

.3 Maintain the Work in tidy condition, free from accumulation of waste products and debris.

.4 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

.5 Clean interior areas prior to start of finish work; maintain areas free of dust and other contaminants during finishing operations.

1.4 FINAL CLEANING

.1 Refer to General Conditions.

.2 When the Work is complete, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris and leave the Work clean and suitable for occupancy by the Owner.

.3 Leave the work 'broom clean' before the inspection process commences.

.4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel or baked enamel. Replace broken, scratched or disfigured glass.

.5 Clean lighting reflectors, lenses, and other lighting surfaces.

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.6 Remove stains, spots, marks, and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.

.7 Vacuum clean and dust building interiors, behind grilles, louvers and screens.

.8 Wax, seal, shampoo, or prepare floor finishes as recommended by the manufacturer.

.9 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.10 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

.11 Inspect finishes, fitments and equipment and ensure proper workmanship and operation.

.12 Broom clean and wash exterior walks, steps and platforms.

.13 Remove dirt and other disfigurations from exterior surfaces.

.14 Clean and sweep roofs, gutters, areaways, sunken wells.

.15 Sweep and wash clean paved areas. Rake clean other surfaces of grounds.

1.5 SNOW REMOVAL

.1 If required, provide snow removal at Substantial Performance of the Work.

.2 Clean snow from surfaces accessible to pedestrians such as paving, sidewalks and pathways, steps, platforms and decks.

.3 Only temporary stockpiling of snow during removal process is permitted. Promptly remove stockpiled snow from site.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Text, schedules and procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:

.1 Diversion of Materials.

.2 Materials Source Separation Program (MSSP).

.3 Canadian Governmental Responsibility for the Environment Resources.

1.2 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 35 43 – Environmental Procedures.

1.3 DEFINITIONS

.1 Materials Source Separation Program (MSSP): Consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.2 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.

.3 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.4 Recycling: Process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.5 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.6 Separate Condition: Refers to waste sorted into individual types.

.7 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.

1.4 DOCUMENTS

.1 Maintain at job site, one copy of following documents:

.1 Material Source Separation Program.

1.5 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare and submit following prior to project start-up:

.1 Submit 2 copies of Materials Source Separation Program (MSSP) description.

1.6 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Consultant.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility.

1.7 WASTE PROCESSING SITES

.1 Waste processing sites: approved sites under provincial jurisdiction.

1.8 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be recycled in locations as directed by Consultant.

.2 Unless specified otherwise, materials for recycling become Contractor's property.

.3 Protect, stockpile, store construction waste.

.4 Transport and deliver recyclable items to licensed facility.

.5 Protect surface drainage, mechanical and electrical from damage and blockage.

.6 Prevent contamination of materials to recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off-site processing facilities for separation.

1.9 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner or other contaminants into waterways, storm, or sanitary sewers.

1.10 USE OF SITE AND FACILITES

.1 Execute work with least possible interference or disturbance to normal use of premises.

1.11 SCHEDULING

.1 Coordinate Work with other activities on site to ensure timely and orderly progress of Work

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 APPLICATION

.1 Handle waste material not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work and leave work area in clean and orderly condition.

.2 Clean up work area as work progresses.

.3 Source separate materials to be reused/recycled into specific sort areas.

3.3 DIVERSION OF MATERIALS

.1 From the following list, separate materials from general waste stream and stockpile in separate piles or containers as reviewed by Consultant, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas

.2 Provide instruction on disposal practices

.2 On-site sale of reusable materials in not permitted.

END OF SECTION

1.1 SECTION INCLUDES

.1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 RELATED SECTIONS

.1 Section 00 72 00 – General Conditions.

.2 Section 00 73 00 – Supplementary General Conditions.

.3 Section 01 78 00 – Closeout Submittals.

1.3 REFERENCES

.1 General Conditions and Supplements.

1.4 INSPECTION AND DECLARATION FOR SUBSTANTIAL PERFORMANCE OF THE WORK

.1 Contractor's Inspection: prior to application for Certificate of Substantial Performance of the Work Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made and that the building is clean and in condition ready for occupancy.

.2 Request Consultant's Inspection.

.2 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Consultant shall prepare a list of defects deficiencies and provide a signed copy to the Contractor.

.3 Contractor shall correct Work accordingly.

.4 Declaration of Substantial Performance: when Consultant considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance of the Work. Refer to General Conditions for specifics to application.

.5 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.6 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with General Conditions.

1.5 INSPECTION AND DECLARATION FOR FINAL COMPLETION

.1 When satisfied that the entire work is complete, make a final inspection of the Work to ensure that it is complete.

.2 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies have been submitted.

.5 Operation of systems have been demonstrated to Owner's personnel.

.6 Building and premises are clean and ready for occupancy.

.7 Work is complete and ready for Final Inspection.

.3 Final Inspection: when items noted above are completed, request final inspection of Work by Consultant and Contractor. The Consultant's final review of the Work will be completed within 10 days of the Consultant's receipt of the written request from the Contractor. The final review will constitute the review precedent to the issuance of the Final Certificate for Payment.

.4 Consultant will list defects or deficiencies determined by this review and will provide a copy to the Contractor. The list will be recognized as a final list for acceptance of the Work under the Contract. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-inspection, in writing.

.5 If a re-inspection is required Consultant shall conduct the re-inspection within 7 days of date of the request. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-inspection. If Work is deemed complete by the Consultant submit invoice for final payment.

.6 Final Payment: When the Consultant considers final deficiencies and defects corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to General Conditions.

END OF SECTION

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1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

.7 Final site survey.

1.2 RELATED SECTIONS

.1 Section 01 45 00 – Quality Control: testing and inspections; mock-ups.

.2 Section 01 71 00 – Examination and Preparation: laying out of the Work; final site survey.

.3 Section 01 77 00 – Closeout Procedures: inspections for Substantial Performance of the Work and Final Completion.

1.3 SUBMISSION

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final review, with Consultant's comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, 3 final copies of operating and maintenance manuals in English.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 If requested, furnish evidence as to type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf, letter size format with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings.

.4 Identify contents of each binder on spine.

.5 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.6 Arrange content by systems under Section numbers and sequence of Table of Contents.

.7 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.8 Text: Manufacturer's printed data, or typewritten data.

.9 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project.

.1 Date of submission; names,

.2 Addresses and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 – Quality Control.

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for review by Consultant.

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on 3 sets of black line opaque drawings, and within copy of Project Manual, provided by Consultant.

.2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.9 EQUIPMENT AND SYSTEMS

.1 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.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams

.4 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.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.

.15 Additional requirements: As specified in individual specification sections.

1.10 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.11 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store where directed by Owner.

.4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.2 Maintenance Materials:

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store where directed by Owner.

.4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

.3 Special Tools:

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to site; place and store where directed by Owner.

.4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

.4 Storage, Handling and Protection:

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.12 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of

warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Building demolition excluding removal of hazardous materials and toxic substances.

.2 Selective demolition of built site elements.

.3 Selective demolition of building elements for alteration purposes.

.4 Abandonment and removal of existing utilities and utility structures.

1.2 RELATED REQUIREMENTS

.1 Section 01 11 00 - Summary of Work: Limitations on Contractor's use of site and premises; sequencing and phasing requirements.

.2 Section 01 56 00 - Temporary Barriers and Enclosures: Site fences, security, protective barriers, weather enclosures; protection of existing construction to remain.

.3 Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

.4 Section 01 71 00 - Examination and Preparation: Project conditions; protection of benchmarks, survey control points.

1.3 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Site plan: Showing:

.1 Areas for temporary construction and site offices.

.3 Demolition plan: Submit demolition plan as specified by workplace health and safety, and local authorities.

.1 Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.

.2 Include a summary of safety procedures.

.4 Project record documents: Accurately record actual locations of capped and active utilities and subsurface construction.

Part 2 Products -- NOT USED

Part 3 Execution

3.1 SCOPE

.1 Remove portions of existing buildings and site work in the sequence indicated on the Drawings or as required for stages construction.

.2 Remove other items indicated, for salvage, relocation, and recycling.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

.1 Comply with other requirements specified in Division 01.

.2 Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

- .1 Obtain required permits.
- .2 Use of explosives is not permitted.
- .3 Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
- .4 Provide, erect, and maintain temporary barriers and security devices.
- .5 Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
- .6 Conduct operations to minimize effects on and interference with adjacent structures and occupants.
- .7 Do not close or obstruct roadways or sidewalks without permit.
- .8 Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
- .9 Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

.3 Do not begin removal until receipt of notification to proceed from Owner.

.4 Do not begin removal until built elements to be salvaged or relocated have been removed.

.5 Protect existing structures and other elements that are not to be removed.

- .1 Provide bracing and shoring.
- .2 Prevent movement or settlement of adjacent structures.
- .3 Stop work immediately if adjacent structures appear to be in danger.

.6 Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

.7 If hazardous materials are discovered during removal operations, stop work and notify Consultant and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

.8 Perform demolition in a manner that maximizes salvage and recycling of materials.

- .1 Dismantle existing construction and separate materials.
- .2 Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

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3.3 EXISTING UTILITIES

.1 Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

.2 Protect existing utilities to remain from damage.

.3 Do not disrupt public utilities without permit from authority having jurisdiction.

.4 Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

.5 Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

.6 Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

.7 Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

.8 Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

.1 Drawings showing existing construction and utilities are based on casual site observation and existing record documents only.

.1 Verify that construction and utility arrangements are as indicated.

.2 Report discrepancies to Consultant before disturbing existing installation.

.3 Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

.2 Separate areas in which demolition is being conducted from other areas that are still occupied.

.1 Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on Drawings.

.2 Provide sound retardant partitions of construction indicated on Drawings in locations indicated on Drawings.

.3 Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

.4 Remove existing work as indicated and as required to accomplish new work.

.1 Remove items indicated on Drawings.

.5 Services (including but not limited to HVAC, plumbing, fire protection, electrical,

and telecommunications): Remove existing systems and equipment as indicated.

.1 Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.

.2 Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

.3 See Section 01 10 00 for other limitations on outages and required notifications.

.4 Verify that abandoned services serve only abandoned facilities before removal.

.5 Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

.6 Protect existing work to remain.

.1 Prevent movement of structure; provide shoring and bracing if necessary.

.2 Perform cutting to accomplish removals neatly and as specified for cutting new work.

.3 Repair adjacent construction and finishes damaged during removal work.

.4 Patch as specified for patching new work.

3.5 DEBRIS AND WASTE REMOVAL

.1 Remove debris, junk, and trash from site.

.2 Leave site in clean condition, ready for subsequent work.

.3 Clean up spills and wind-blown debris from public and private lands.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Surface treatments for concrete floors and slabs.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

1.3 REFERENCE STANDARDS

.1 CSA A23.1/A23.2 - Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete 2019.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Coordinate the work with concrete floor placement, protection, and concrete floor curing.

.2 No satisfactory chemical or cleaning procedure is available to remove petroleum stains from concrete surface. Ensure the following prevention measures are taken:

.1 Diaper hydraulic powered equipment to avoid concrete staining.

.2 Prohibit vehicle parking on concrete surfaces to be polished.

.3 Prohibit pipe cutting operations on concrete surfaces to be polished.

.4 Prohibit storage of items over concrete surfaces to be polished for minimum 28 days after concrete placement.

.5 Prohibit storage of ferrous metals on concrete surfaces to be polished.

.6 Do not allow acids and acidic detergents to come into contact with concrete surfaces to be polished.

.7 Protect concrete surfaces to be polished from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment.

.8 Inform trades that slab must be continuously protected in accordance with manufacturer’s instructions.

.2 Pre-installation meeting:

.1 Conduct meeting at project site to comply with requirements in Division 01.

.2 Conduct meeting before placing concrete to discuss concrete placing requirements, including tolerances and flatness, with respect to polished concrete floor finishes.

.3 Meeting attendees to include: Concrete producer, concrete placer, concrete finisher, manufacturer’s representative of liquid applied densifier, Owner, Consultant, and Construction Manager.

.4 Meeting agenda shall include, but not be limited to:

.1 Discussion and evaluation of substrate conditions, surface preparations, sequence of procedures, and other preparatory work.

.2 Protecting concrete floor surfaces until polishing work begins.

.3 Details of each step of grinding, honing, and polishing operations.

.4 Application of liquid applied products.

.5 Protecting polished concrete floors after polishing work is complete.

1.5 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

.3 Installer qualification statement.

.4 Maintenance data: Provide data on maintenance and renewal of applied finishes.

1.6 QUALITY ASSURANCE

.1 Installer qualifications:

.1 Minimum 10 projects performed within three years of similar type, size and complexity, with adequate number of skilled workers who are thoroughly trained and experienced.

.2 Familiar with specified requirements and methods needed for proper performance of work of this Section.

.3 Approved or certified by polished concrete system manufacturer.

1.7 MOCK-UPS

.1 See Section 01 45 00 - Quality Control for additional requirements.

.2 Construct mock-up of polished concrete under conditions similar to those that will exist during application, using same personnel who will perform the work, to demonstrate surface finish, colour variations and to determine an acceptable level of workmanship.

.3 Mock-up size: 3 m square.

.4 Locate where directed.

.5 If Consultant determines that mock-ups do not meet requirements, construct additional mock-ups in other area on site as directed by Consultant until mock-ups are approved.

.6 Protect and maintain approved mock-ups during construction in an undisturbed condition as a standard for judging completed work.

.7 Mock-up may remain as part of the work.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials in manufacturer's sealed packaging, including application instructions.

1.9 SITE CONDITIONS

.1 Maintain light level equivalent to a minimum 200 W light source at 2.5 m above the floor surface over each 6 m square area of floor being finished.

.2 Do not finish floors until interior heating system is operational.

.3 Maintain ambient temperature of 10 degrees C minimum.

Part 2 Products

2.1 PERFORMANCE CRITERIA

.1 Room perimeter and field areas; horizontal and vertical surfaces: same level of grind and finish.

2.2 DENSIFIERS AND HARDENERS

.1 Liquid densifier/hardener - Type CONC-D: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.

.1 Composition: Sodium silicate or lithium silicate. Use the same densifier product as used for polished concrete.

2.3 POLISHED CONCRETE SYSTEM

.1 Polished concrete system - Type CONC: Materials, equipment, and procedures designed and supplied by a single manufacturer to produce dense polished concrete of the specified sheen, including cleaner, sodium silicate or lithium silicate densifier, and non-film forming sealer/enhancer.

.1 Products:

.1 Curecrete Distribution, Inc; RetroPlate 99.

.2 W.R. Meadows; Induroshine.

.3 Laticrete: FGS Permashine.

.4 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

.2 Cleaner: specifically formulated, residue-free floor cleaner designed to clean concrete treated with densifier, and approved by densifier manufacturer.

.3 Sealer/enhancer: Non-film forming, stain- and soil-inhibitor, penetrating sealer as recommended by densifier manufacturer, and compatible with densifier.

.4 Repair material: Polished concrete system manufacturer's recommended polishable mortar designed to repair cracks, spalling and surface imperfections, with sufficient bonding to adhere after polishing process and to have abrasion resistance equal to or greater than adjacent substrate; able to receive dye and tinted to match adjacent surface prior to application.

.5 Grout material: Polished concrete system manufacturer's recommended thin mortar used for filling voids, pinholes and small surface cracks, with sufficient bonding to adhere after polishing process and to have abrasion resistance equal to or greater than adjacent substrate; able to receive dye and tinted to match adjacent surface prior to application.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that floor surfaces are acceptable to receive the work of this section.

.1 Concrete floors to receive polished concrete floor finish will be installed to meet Floor Flatness (FF) rating of 40 and Floor Levelness (FL) rating of 30 in accordance with CSA A23.1/A23.2.

.2 Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

.3 Verify that moisture vapour emission rates from concrete and relative humidity in concrete are within limits established by manufacturer of concrete finishing products.

3.2 GENERAL

.1 Finish floors and slabs in general conformance with CSA A23.1/A23.2.

.2 Apply materials in accordance with manufacturer's instructions.

3.3 PREPARATION

.1 Protect adjacent surfaces non-finished areas from drips, overflow, and overspray.

Immediately remove excess material.

.2 Prepare and clean concrete surfaces, free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

.3 Limit and control damage from excessive dust caused by grinding/polishing procedure.

3.4 DENSIFIERS AND HARDENERS

.1 Apply densifiers and hardeners in accordance with manufacturer's instructions.

3.5 CONCRETE POLISHING

.1 General: Start floor finish application in presence of manufacturer’s technical representative.

.2 Execute using materials, equipment, and procedures specified by manufacturer, using manufacturer approved installer, matching approved mock-ups for aggregate exposure, sheen, and workmanship.

.3 Aggregate exposure and finish: to Concrete Polishing Council (CPC):

Room finish schedule designation	Aggregate exposure	Sheen
POLISHED CONC	Class B - fine aggregate	Level 2 - satin (honed)

.4 Protect finished surface as required and as recommended by manufacturer of polishing

system. Do not tape protection directly to finished floor areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 91 00 - Painting: field painting metal stairs.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM A53/A53M - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A325M - Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .5 ASTM E84, Surface Burning Characteristics of Building Materials

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.40 - Anti-corrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-1.181 - Ready-Mixed Organic Zinc-Rich Coating.
- .3 CAN/CSA-G40.20/G40.21 - General Requirements for Rolled or Welded Structural Quality Steel.

.3 Canadian Standards Association (CSA)

- .1 CSA W59 - Welded Steel Construction (Metal Arc Welding).

.4 National Association of Architectural Metal Manufactures (NAAMM)

- .1 AMP 510, Metal Stair Manual.

.5 National Building Code of Canada (NBC)

.6 The Society for Protective Coatings (SSPC)

- .1 SSPC Painting Manual, Volume 2, Systems and Specifications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings:

- .1 Indicate construction details, sizes of steel sections, and thickness of steel sheet, metal grating, handrails and balustrades. Indicate connections to building.
- .2 Indicate components and installation methods to conform to specified seismic design and construction requirements of National Building Code.
- .3 Each shop drawing submitted shall bear the stamp of a qualified professional engineer registered in Canada.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and manufacturer's instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect stairs from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Steel sections: to CAN/CSA-G40.20/G40.21 Grade 300 W.

.2 Steel plate: to CAN/CSA-G40.20/G40.21, Grade 260 W.

.3 Steel pipe: to ASTM A53/A53M, Type S (seamless), Grade B, standard weight, schedule 40, galvanized, of diameters indicated.

.4 Welding materials: to CSA W59.

.5 Bolts: to ASTM A307. Use hot dipped galvanized bolts for galvanized stairs.

.6 High strength bolts: to ASTM A325M.

.7 Moulded fibreglass gratings (for exterior stair treads and landings):

.1 Fabricated of fibreglass reinforced plastic (FRP) using polyester resin meeting Class 1 Flame Spread Rating per ASTM E-84 test standards.

.2 Top surface with slip-resistant texture.

.3 Colour: selected by Consultant from manufacturer’s selection.

.4 Grating treads with contrasting safety yellow nosing.

.5 Clips and fasteners for FRP gratings: stainless steel Type 316.

.6 Acceptable material: National Grating Moulded Mini-Mesh Grating.

2.2 DESIGN REQUIREMENTS

.1 Design and fabricate metal stair, balustrade, and landing construction and connections to National Building Code of Canada vertical and horizontal live load requirements.

.2 Railing assembly, wall rails, and attachments to resist lateral force of 333 N (75 lbs) at any point without damage or permanent set.

.3 Fabricate stair assembly to NAAMM - Metal Stairs Manual, for Class as specified.

.4 Seismic design requirements:

.1 Design acoustical ceiling installation to resist effects of earthquake motions under seismic design conditions specified in Contract Documents. Provide components as necessary to implement design.

.2 Project site is designated as Class C seismic conditions in accordance with the National Building Code.

2.3 FABRICATION

.1 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.2 Accurately form connections with exposed faces flush. Mitres and joints tight. Make risers of equal height.

.3 Grind or file exposed welds and steel sections smooth.

.4 Shop fabricate stairs in sections as large and complete as practicable.

2.4 STEEL PAN STAIRS

.1 Interior stairs: concrete filled steel pan construction.

.2 Detail and fabricate metal stairs to NAAMM, AMP 510 and reviewed shop drawings.

.1 Type: as indicated.

.2 Class: commercial.

.3 Fabricate stairs with closed riser steel pan construction.

.4 Form treads and risers from 3 mm thick steel plate. Secure treads and risers to L32 x 32 x 5 steel angles horizontal and vertical welded to stringers.

.5 Form wall stringers from steel channels.

.6 Form outer stringers from steel channels.

.7 Form landings from 3 mm thick steel plate, reinforced by L55 x 55 x 6 steel angles spaced at 400 mm on centre.

.8 Provide clip angles for fastening of furring channels, where applied finish is indicated for underside of stairs and landings.

.9 Extend stringers around mid-landings to form steel base.

.10 Close ends of stringers where exposed.

2.5 GRATING STAIRS

.1 Exterior stairs: grating stairs of steel sections with fibreglass grating for treads and landing.

.2 Detail and fabricate metal stairs to NAAMM, AMP 510 and reviewed shop drawings.

.1 Type: as indicated.

.2 Class: industrial.

.3 Form steel grating treads and landings from fiberglass reinforced gratings and secure to stringers and supports with stainless steel hold-down clips and bolts.

.1 Field cut and drill fiberglass reinforced plastic products with carbide or diamond tipped bits and blades.

.2 Seal cut or drilled surfaces in accordance with manufacturer's instructions.

.3 Follow manufacturer's instructions when cutting or drilling fiberglass products or using resin products; provide adequate ventilation.

.4 Form stringers from steel channels.

.5 Extend stringers around mid-landings to form steel base.

.6 Provide steel pipe and bar balustrades as specified in this Section.

.7 All steel components galvanized.

2.6 PIPE BALUSTRADES

.1 Construct balusters from steel components to sizes and profiles indicated.

.2 Handrails and posts: steel pipe to sizes indicated. Cap and weld exposed ends. Terminate at abutting wall with end flange.

.3 Pickets: steel bars to sizes and profiles indicated. Space pickets at maximum 100 mm on centre.

.4 Weld balustrades to stringers and steel pipe railings as indicated.

2.7 FINISHES

.1 Steel Members: Galvanize after fabrication to ASTM A123/A123M. Zinc coating thickness 600 g/sq. m.

.2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

.3 Shop paint primer: to CAN/CGSB-1.40.

.4 Schedule of finishes

.1 Interior stairs: shop coat prime, for site painting.

.2 Exterior stairs: galvanized, painted.

2.8 SHOP PAINTING

.1 Clean surfaces in accordance with SSPC Painting Manual Volume 2.

.2 Apply one coat of shop primer except interior surfaces of pans.

.3 Apply two coats of primer in different colours to parts inaccessible after final assembly.

.4 Use primer as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces, free from rust, scale, grease, do not paint when temperature is below 7°C.

.5 Do not paint surfaces to be field welded.

Part 3 Execution

3.1 INSTALLATION OF STAIRS

.1 Install in accordance with NAAMM, Metal Stair Manual and reviewed shop drawings.

.2 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.

.3 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.4 Do welding work in accordance with CSA W59 unless indicated specified otherwise.

.5 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

.6 Touch-up galvanized surfaces with zinc primer where burned by field welding. Grind surfaces to bare metal and apply primer.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Provide labour, materials, Products, equipment and services to complete the Standard Ladders specified herein. This includes, but is not necessarily limited, to

.1 Modular aluminium Standard Ladders and platform ladder system.

.2 Auxiliary materials required for a complete installation

.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only.

.3 Refer to Section 05 50 00 – Metal Fabrications: for miscellaneous metal fabrications at roof level.

.4 Refer to Section 07 62 00 – Sheet Metal Flashing and Trim: for metal flashing, and miscellaneous sheet metal trim and accessories.

1.2 REFERENCE STANDARDS

.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply

.2 All materials, installation and workmanship shall comply with all applicable requirements and standards.

.3 ANSI/ASSE A1264.1: Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings and Guardrail/Handrail System.

.4 ASTM B209/B209M: Standard Specification for Aluminium and Aluminium-Alloy Sheet and Plate

.5 ASTM B221/B221M: Standard Specification for Aluminium and Aluminium-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

1.3 SUBMITTALS

.1 Make Submittals in accordance with provisions indicated in Section 01 33 00, Submittal Procedures.

.2 Product Data: Submit Product information for the Standard Ladders work specified in this Section.

.1 Submit manufacturer's installation instructions.

.3 Shop Drawings: Submit Shop Drawings including dimensions that have been verified to be suitable for the project and reviewed by the contractor prior to submission.

.1 Indicate sizes, profiles, connections, size and types of fasteners and accessories.

.2 Drawings to be stamped by an engineer allowed to practice in the province of installation or as accepted by the approving authority once the dimensions of

the project have been finalized and approved.

1.4 CLOSEOUT SUBMITTALS

.1 General Requirements and Procedures for Closeout Submittals: in accordance with Section 01 78 00 – Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years of experience manufacturing roof accessories and similar materials

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Product Requirement and in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements: Store materials in clean, dry, and well-ventilated area.

Part 2 Products

2.1 MANUFACTURERS

.1 Basis of Design

.1 Roof Access Ladder: Skyline Group

.2 Fold Down Attic Ladder: CAI Safety Systems

.2 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.2 REGULATORY REQUIREMENTS

.1 Applicable Building Code: National Building Code of Canada, 2020

.2 Applicable Health and Safety Regulation:

.1 Manitoba: Manitoba Workplace Safety and Health Act and regulation 2020

2.3 PRODUCT

.1 Roof Access Ladder: Vertical fixed ladder extending to roof access hatch.

.1 Manufactured from high grade structural aluminum with powder coated finish

.2 Overall ladder width – 605mm

.3 Distance between vertical side rails – 525mm

.4 Rung diameter – 50 x 35mm (profiled)

.5 Rung spacing – 300mm

.6 Vertical side rail extension above landing surface – 900 to 1100mm

.7 Minimum clearance behind ladder – 200mm

.8 Rung sections – 2.9kg/M (ex. fixing brackets and fixings)

.9 Design Requirements:

.1 Industry rated, suited for high frequency usage

.2 Recommended for single person use – 150kg

.3 Ladder must meet the loads of OBC Submittals

.10 Basis of Design: 7000 KATT Modular Ladder System by Skyline Group

2.4 METAL MATERIALS

.1 Aluminium Extrusions: to ASTM B221M (ASTM B221), 6061-T6 or 6106-T6 alloy unless indicated otherwise.

.2 Material substitutions of equal or greater properties are admissible.

2.5 AUXILIARY MATERIALS

.1 Provide materials and types of fasteners, protective coatings, and other auxiliary components required by manufacturer for a complete installation.

.2 Fasteners: Manufacturer-recommended for application and metals specified. Unless otherwise indicated, Provide the following:

.1 Drilling screws: to ASTM A479/A479M; Type 410 or 18-8 Stainless Steel
Machine screws: 18-8 Stainless Steel

2.6 FABRICATION

.1 Site verify all dimensions prior to fabrication.

.2 Fabricate work square, true, and accurate. Deburr all cut edges. Properly fit and secure all joints.

2.7 GENERAL FINISH REQUIREMENTS

.1 Unless otherwise specified, all aluminium components specified in this Section shall be mill finish or "as fabricated" aluminium.

Part 3 Execution

3.1 EXAMINATION

.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Proceed with installation only after unacceptable conditions have been remedied. Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

.1 Assemble and install Standard Ladder system in accordance with manufacturer's instructions, and accepted shop drawings.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Provide labour, materials, products, equipment and services to complete the roof walkway system specified herein. This includes, but is not necessarily limited, to:

.1 Modular aluminum walkway and platform ladder system.

.2 Auxiliary materials required for a complete installation.

.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only.

.1 Section 05 50 00 – Metal Fabrications: metal fabrications at roof level

.2 Section 05 51 36.19 – Metal Platforms: platforms at roof level

.3 Section 07 62 00 – Sheet Metal Flashing and Trim: metal flashings and miscellaneous sheet metal trim and accessories.

1.2 REFERENCE STANDARDS

.1 Reference Standards: Unless otherwise indicated in the Section or the Building Code, the latest edition of reference standards as of the Project's Bid Closing deadline apply.

.2 All materials, installation and workmanship shall comply with all applicable requirements and standards.

.3 ANSI/ASSE A1264.1: Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace, Floor, Wall and Roof Openings and Guardrail/Handrail Systems

.4 ASTM B209/B209M: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.5 ASTM B221/B221M: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

1.3 ACTION SUBMITTALS

.1 Make Submittals in accordance with provisions indicated in Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit Product information for the roof Sentry Walkway work specified in this Section.

.1 Submit manufacturer's installation instructions.

.3 Shop Drawings: Submit Shop Drawings including dimensions that have been verified to be suitable for the project and reviewed by the contractor prior to submission.

.1 Drawings to be stamped by an engineer allowed to practice in the province of installation or as accepted by the approving authority once the dimensions of the project have been finalized and approved.

1.4 CLOSEOUT SUBMITTALS

.1 General Requirements and Procedures for Closeout Submittals: in accordance with Section 01 78 00 – Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing roof accessories and similar materials.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Product Requirements and in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements: Store materials in clean, dry, and well-ventilated area.

PART 2 PRODUCTS

2.1 MANUFACTURERS

.1 Basis of Design:
Skyline Group; 19896 Hwy 7, Perth ON, K7H 3C9;
web: www.skylinegroupintl.com
TEL: 613-2674493.

.2 Substitutions: Conforming to requirements of Section 01 25 00 – Substitution Procedures

2.2 REGULATORY REQUIREMENTS

.1 Applicable Building Code: Manitoba Building Code of Canada

.2 Applicable Health and Safety Code: Manitoba Workplace Safety and Health Act and Regulation 2020

2.3 ROOF WALKWAY

.1 Description: Provide modular sentry walkway for sloped snap lock metal roof, and shingle roofs. Refer to Architectural drawings for location and slope details of roof.

.2 Sentry Walkway system must consist of aluminum metal framing designed to create a clear walking path around mechanical equipment. It has the following components:

.1 Handrails including handrail splices, elbows, end caps, and braces

.2 Kneerails including knee rail splices, elbows, and end caps

.3 Posts

.4 Supports including bracing

.5 Snap lock compatible clip system for non penetrating attachment.

.6 Edge bars and joiner bars

.7 Fixing disks

.8 Pacing/Grating

.9 Auxiliary materials required for a complete installation.

.3 Framing: Provide necessary support framing, brackets, connectors, and additional accessories and components for a complete installation.

.4 Support Stands: Manufacturer's standard

.5 Basis of Design: Sentry Walkway by Skyline Group.

2.4 METAL MATERIALS

.1 Aluminum Extrusions: to ASTM B221M (ASTM B221), 6061-T6 or 6106-T6 alloy unless indicated otherwise.

.2 Material substitutions of equal or greater properties are admissible.

2.5 AUXILIARY MATERIALS

.1 Provide materials and types of fasteners, protective coatings, and other auxiliary components required by manufacturer for a complete installation.

.2 Fasteners: Manufacturer-recommended for application and metals specified. Unless otherwise indicated, Provide the following:

.1 Drilling screws: to ASTM A479/A479M; Type 410 or 18-8 Stainless Steel

.2 Machine screws: 18-8 Stainless Steel

2.6 FABRICATION

.1 Fabricate work square, true, and accurate. Deburr all cut edges. Properly fit and secure all joints.

2.7 GENERAL FINISH REQUIREMENTS

.1 Unless otherwise specified, all aluminum components specified in this Section shall be mill finish or "as fabricated" aluminum.

Part 3 Execution

3.1 EXAMINATION

.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Proceed with installation only after unacceptable conditions have been remedied. Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

.1 Assemble and install modular Sentry Walkway system in accordance with manufacturer's instructions, and accepted shop drawings.

END OF SECTION

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PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Aluminum pipe and tube railings.

.2 Related Requirements:

.1 Section 05 51 00 – Metal Stairs for steel tube railings associated with metal pan stairs.

1.2 COORDINATION

.1 Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

.2 Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

.3 Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

.1 Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

.2 Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

.3 Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

.1 Show method of connecting and finishing members at intersections.

.4 Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

.1 Qualification Data: For testing agency.

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.2 Welding certificates.

.3 Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

.4 Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

.5 Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

.1 Welding Qualifications: Qualify procedures and personnel according to the following:

.1 AWS D1.1/D1.1M, "Structural Welding Code - Steel."

.2 AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

.1 Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

.1 Source Limitations: Obtain each type of railing from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

.1 Delegated Design: Engage a qualified professional engineer to design railings, including attachment to building construction.

.2 Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

.1 Handrails and Top Rails of Guards:

.1 Uniform load of 50 lbf/ ft. applied in any direction.

.2 Concentrated load of 200 lb applied in any direction.

.3 Uniform and concentrated loads need not be assumed to act concurrently.

.4 Deflection limited to L/360 or 1/8 inch whichever is less.

.2 Infill of Guards:

.1 Concentrated load of 50 lb applied horizontally on an area of 1 sq. ft.

.2 Infill load and other loads need not be assumed to act concurrently.

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.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

.1 Temperature Change: 120 deg F, ambient; 180 deg F material surfaces.

2.3 METALS, GENERAL

.1 Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

.2 Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

.1 Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 50mm clearance from inside face of handrail to finished wall surface.

2.4 ALUMINUM

.1 Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

.2 Extruded Bars and Tubing: ASTM B 221ASTM B 221, Alloy 6063-T5/T52.

.3 Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

.4 Drawn Seamless Tubing: ASTM B 210ASTM B 210, Alloy 6063-T832.

.5 Plate and Sheet: ASTM B 209ASTM B 209, Alloy 6061-T6.

.6 Die and Hand Forgings: ASTM B 247ASTM B 247, Alloy 6061-T6.

.7 Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.5 FASTENERS

.1 General: Provide the following:

.1 Aluminum Railings: Type 304 or Type 316 stainless-steel fasteners.

.2 Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

.2 Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

.3 Fasteners for Interconnecting Railing Components:

.1 Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.

.2 Provide Phillips flat-head machine screws for exposed fasteners unless otherwise indicated.

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.4 Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

.1 Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.6 MISCELLANEOUS MATERIALS

.1 Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

.1 For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

.2 Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

.2 Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.7 FABRICATION

.1 General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

.2 Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

.3 Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately .8mm unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

.4 Form work true to line and level with accurate angles and surfaces.

.5 Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

.6 Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

.7 Connections: Fabricate railings with welded connections unless otherwise indicated.

.8 Welded Connections: Cope components at connections to provide close fit or use fittings designed for this purpose. Weld all around at connections, including at fittings.

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.1 Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

.2 Obtain fusion without undercut or overlap.

.3 Remove flux immediately.

.4 At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

.9 Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

.10 Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

.1 Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

.2 Form Changes in Direction as Follows:

.3 As detailed.

.11 For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components. M. Close exposed ends of railing members with prefabricated end fittings.

.12 Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of return.

.13 Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

.1 At brackets and fittings fastened to plaster or gypsum board partitions, provide crush resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

.14 Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

.15 For railing posts set in concrete, provide stainless-steel sleeves not less than 152mm long with inside dimensions not less than 12.7mm greater than outside dimensions of post, with metal plate forming bottom closure.

.16 For removable railing posts, fabricate slip-fit sockets from stainless-steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

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.1 Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

.17 Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.8 ALUMINUM FINISHES

.1 Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

.2 Class I Clear Anodic Finish: AAMA 611, AA-M12C22A41.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

.1 Fit exposed connections together to form tight, hairline joints.

.2 Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

.1 Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

.2 Set posts plumb within a tolerance of 1/16 inch in 3 feet.

.3 Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

.3 Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

.1 Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

.4 Adjust railings before anchoring to ensure matching alignment at abutting joints.

.5 Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

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3.3 RAILING CONNECTIONS

.1 Nonwelded Connections:

.1 Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

.2 All connection or splice plate and fastener hole edges are to be ground smooth.

.2 Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

.3 Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

.1 Leave anchorage joint exposed with 3mm reveal in anchoring material. Seal with silicone joint sealant specified Section 07 92 00 – Joint Sealants.

.2 Anchor posts to metal surfaces with rectangular flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

.1 For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.

3.5 ATTACHING RAILINGS

.1 Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.

.2 Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

.3 Secure wall brackets and railing end flanges to building construction as follows:

.1 For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

.2 For hollow masonry anchorage, use toggle bolts.

.3 For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.6 ADJUSTING AND CLEANING

.1 Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

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3.7 PROTECTION

.1 Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Mechanical and electrical equipment requiring wood curbs, nailers, sleepers on roof deck.

.2 Mechanical and electrical equipment requiring plywood backboards.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM D 1761 - Standard Test Methods for Mechanical Fasteners in Wood.
- .2 ASTM F1667- Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.2 American Wood-Preservers' Association (AWPA)

- .1 AWPA M2 - Standard Inspection of Treated Wood Products.
- .2 AWPA M4 - Standard for the Care of Preservative-Treated Wood Products.

.3 Canadian Standards Association (CSA)

- .1 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 CSA O80 Series - Wood Preservation.
- .3 CSA O112 - Series, CSA Standards for Wood Adhesives.
- .4 CSA O121 - Douglas Fir Plywood.
- .5 CAN/CSA O141 - Softwood Lumber.
- .6 CSA O151 - Canadian Softwood Plywood.
- .7 CSA O153 - Popular Plywood.
- .8 CAN/CSA O325.0 - Construction Sheathing.

.4 National Lumber Grades Authority (NLGA)

- .1 Standard Grading Rules for Canadian Lumber.

1.3 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and manufacturer's written instructions

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

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.3 Storage and Handling Requirements:

.1 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.

.2 Replace defective or damaged materials with new.

.3 Store separated reusable wood waste convenient to cutting station and work areas.

Part 2 Products

2.1 LUMBER MATERIALS

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:

.1 CAN/CSA-O141 - Softwood Lumber.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Glued end-jointed (finger-jointed) lumber is not acceptable

.3 Furring, blocking, nailing strips, grounds, rough bucks, fascia backing: S-P-F “Standard” or better grade.

2.2 PANEL MATERIALS

.1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.

.2 Douglas fir plywood (DFP): to CSA 0121, standard construction.

.3 Canadian softwood plywood (CSP): to CSA 0151, standard construction.

.4 Poplar plywood (PP): to CSA 0153, standard construction.

2.3 ACCESSORIES

.1 General purpose adhesive: to CSA O112 Series.

.2 Nails, spikes and staples: to ASTM F1667.

.3 Bolts: 12 mm diameter unless indicated otherwise, complete with nuts and washers. Hot dipped galvanized.

.4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead plugs, recommended for purpose by manufacturer.

.5 Explosive actuated fastening devices: recommended for purpose by manufacturer.

2.4 FASTENER FINISHES

.1 Galvanizing: to CSA G164, use galvanized finished fasteners for exterior work, pressure-preservative treated lumber.

2.5 PRESSURE PRESERVATIVE TREATED WOOD

.1 Provide lumber and plywood materials pressure preservative treated for the following:

.1 Furring, blocking, nailing strips, grounds, fascia backing.

.2 Rough bucks at all exterior openings.

.3 Wood below grade or in contact with ground.

.4 Other materials indicated on the drawings.

.2 Preservative: to CSA-O80 Series, water-borne, alkaline copper quaternary (ACQ); or copper azole (CA-C) for clear finish.

.3 Treat material to CSA O80 Series using preservative to obtain minimum net retention for exposures as follows:

.1 UC3.2 - material above grade.

.2 UC4.1 - material below grade or in contact with ground.

.4 Each piece of treated material shall be identified with a tag or ink mark bearing the Canadian Wood Preservers' Bureau quality mark.

.5 Following water-borne preservative treatment, dry material to maximum moisture content of 19% (S-dry) or less.

.6 Field treatment:

.1 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Apply surface applied wood preservative to heartwood exposed from trimming, cutting, or boring.

.3 Remove chemical deposits on treated wood to receive applied finish.

2.6 FIRE RETARDANT TREATED WOOD

.1 Fire Retardant: to CSA O80.20, CSA O80.27, to provide:

.1 Flame Spread Classification: FSC 25 or less.

.2 Smoke developed of not more than: 450.

.2 Treat lumber and plywood by pressure impregnation with fire retardant chemicals in accordance with CSA O80.20 for lumber and CSA O80.27 for plywood.

.3 Following treatment, kiln dry material to maximum moisture content of 19% (S-dry) or less.

.4 Use fire retardant treated lumber and plywood for:

.1 Equipment backboards in mechanical and electrical rooms.

.5 Field treatment:

.1 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Apply surface applied fire retardant to heartwood exposed from trimming, cutting, or boring.

.3 Remove chemical deposits on treated wood to receive applied finish.

Part 3 Execution

3.1 INSTALLATION

.1 Comply with requirements of NBC, Part 9 supplemented by following paragraphs.

.2 Install members true to line, levels and elevations. Space uniformly.

.3 Construct continuous members from pieces of longest practical length.

.4 Install spanning members with “crown-edge” up.

3.2 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

.3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

.4 Use fastenings of following types, except where specific type is indicated or specified:

.1 To hollow masonry, plaster and panel surfaces use toggle bolt.

.2 To solid masonry and concrete use expansion shield with lag screw, lead plug with wood screw.

.3 To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts or explosive actuated stud-bolts.

3.3 FURRING AND BLOCKING

.1 Install furring and blocking as required to space-out and support casework, cabinets, surface applied fixtures and equipment, wall and ceiling finishes, facings, fascia, soffit, siding and other work as indicated.

.2 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.

.3 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.4 NAILING STRIPS, GROUNDS AND ROUGH BUCKS

.1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.2 Except where indicated otherwise, use material at least 38 mm thick.

3.5 ELECTRICAL EQUIPMENT BACKBOARD

.1 Install plywood backboards on 38 x 38 mm wood strapping along vertical edges and at 600 mm on centre for large boards.

.2 Plywood, CSP or DFP, veneer core, G1S grade, square edge, 20 mm thick.

.3 Wood and plywood fire retardant treated.

END OF SECTION

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Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM):

.1 ASTM F1667 – Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)

.1 North American Architectural Woodwork Standards 3.1 (NAAWS).

.3 CSA International

.1 CSA O112 - Series, CSA Standards for Wood Adhesives.

.2 CSA O141, Softwood Lumber.

.3 CSA O151, Canadian Softwood Plywood.

.4 CSA O153, Poplar Plywood.

.4 National Lumber Grades Authority (NLGA):

.1 Standard Grading Rules for Canadian Lumber

.5 National Hardwood Lumber Association (NHLA):

.1 Rules for the Measurement and Inspection of Hardwood and Cypress.

1.2 ACTION AND INFORMATION SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings: Indicate details of construction, profiles, jointing, fastening and other related details. Indicate materials, thicknesses, finishes and hardware.

.3 Samples: submit colour samples of laminated plastics and decorative overlaid composite panels in manufacturers' full selection for colour selection by Consultant.

1.3 ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.4 MOCK-UPS

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up of typical interior window sill, on site in location as directed.

.3 Allow 72 hours for inspection of mock-up by Consultant before proceeding with this work.

.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

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1.5 DELIVERY, STORAGE, HANDLING

.1 Deliver, handle, store and protect materials in accordance with NAAWS.

.2 Protect materials against dampness and damage during and after delivery.

.3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

.4 Maintain relative humidity between 25 and 60% at 22°C during storage and installation.

1.6 SITE CONDITIONS

.1 Ambient Conditions:

.1 Maintain relative humidity between 25 and 60% at 22°C during storage and installation.

.2 During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

.2 Do not deliver or install finish carpentry until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

Part 2 Products

2.1 LUMBER MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 4 - 9% (S-dry) or less in accordance with following standards: CAN/CSA-O141, NLGA, NAAWS.

.2 Hardwood lumber: moisture content 4 - 9 % or less in accordance with following standards: NHLA; NAAWS.

2.2 PANEL MATERIALS

.1 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.2 Poplar plywood (PP): to CSA O153, standard construction.

2.3 ACCESSORIES

.1 Coat Hanger Rod: stainless steel tube 32 mm diameter x 2 mm wall thickness. Lengths indicated. Matching wall flanges.

.1 Acceptable material: K&V 660

.2 Sealant: mildew resistant silicone as specified in Section 07 92 00 – Joint Sealing.

.3 General purpose adhesive: to CSA O112 Series.

.4 Nails and staples: to ASTM F1667.

.5 Wood screws: steel, type and size to suit application.

.6 Finishing washers: solid brass with nickel plated finish.

.7 Splines: wood, plastic, metal.

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.8 Supply bolts and other fastening devices required for satisfactory installation and operation of hardware. Head colour and finish to match hardware item.

Part 3 Execution

3.1 INSTALLATION

.1 Do finish carpentry to NAAWS, except where indicated otherwise.

.2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

.3 Form joints to conceal shrinkage.

3.2 CONSTRUCTION

.1 Fastening:

.1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.

.2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.3 Where screws are used to secure members:

.1 Exposed installation, where specified: flat headed screws with finishing washers.

.2 Concealed installation, where specified: screws and adhesive.

.4 Use fasteners compatible with material through which they pass.

.5 Use heavy-duty fasteners for securing wall hung items.

.2 Coat Rod and Shelf:

.1 Secure ledgers to walls with exposed fasteners, flat headed screws and finishing washers, spaced evenly and symmetrically.

.2 Install shelving on ledgers with concealed fasteners.

.3 Install hanger rods on metal flanges. Secure to walls with heavy duty fasteners and anchors.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Furring and Blocking

.2 Section 06 61 16 – Solid Surfacing Fabrications: countertops.

1.2 REFERENCES

.1 Architectural Woodwork Institute / Architectural Woodwork Manufacturers Association of Canada (AWI/AWMAC):

.1 North American Architectural Woodwork Standards 3.1 (NAAWS).

.2 American National Standards Institute (ANSI)

.1 ANSI A208.1, Particleboard.

.3 American Society for Testing and Materials (ASTM)

.1 ASTM F1667, Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.5 CSA International

.1 CSA O112.4, Standards for Wood Adhesives.

.2 CSA O112.5-1.1-Series-M, Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).

.3 CSA O112.7-1.1-Series M, Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).

.4 CSA O112.10, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).

.5 CSA O141, Softwood Lumber.

.6 CSA O153, Poplar Plywood.

.6 National Electrical Manufacturers Association (NEMA)

.1 ANSI/NEMA LD-3-, High-Pressure Decorative Laminates (HPDL).

.7 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Indicate details of construction, profiles, jointing, fastening and other related details.

.1 Scales: profiles full size, details half full size.

.2 Indicate materials, thicknesses, finishes and hardware.

.3 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

.4 Provide full hardware list and indicate locations for each piece of hardware for each fabricated piece.

.4 Samples:

.1 Submit duplicate samples of laminated plastic for colour selection.

.2 Submit duplicate samples of decorative overlaid composition panels for colour selection.

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels to CSA and ANSI standards.

1.5 DELIVERY, STORAGE & HANDLING

.1 Deliver, store and handle materials in accordance with NAAWS.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store and protect architectural woodwork from nicks, scratches, and blemishes.

.3 Storage and Handling Requirements:

.1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Protect millwork against dampness and damage during and after delivery.

.3 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

.4 Maintain relative humidity between 25 and 60% at 22°C during storage and installation.

.4 Replace defective or damaged materials with new.

1.6 SITE CONDITIONS

.1 Ambient Conditions:

.1 Maintain relative humidity between 25 and 60% at 22°C during storage and installation.

.2 During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

.2 Do not deliver or install casework until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

.1 Provide manufacturer's warranty for laminated plastic work against defects in materials and workmanship in accordance with General Conditions, but for two years.

Part 2 Products

2.1 LUMBER MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 4 - 9% (S-dry) or less in accordance with following standards: CAN/CSA-O141; NLGA; AWMAC, grade as specified by item.

2.2 PANEL MATERIALS

.1 Interior mat-formed wood particleboard: to ANSI A208.1.

.1 Grade: industrial M3, density (minimum) 753 kg/m3 (47 lbs./ft3), moisture content: < 8%. Formaldehyde emissions: not to exceed 0.15 ppm (180 g/m) when tested in accordance with ASTM E1333.

.2 Acceptable material: SierraPine Encore.

.2 Decorative overlaid composite panels (DCP):

.1 Decorative overlay (thermofused melamine), heat and pressure laminated with suitable resin to Grade R or M3 particleboard core.

.2 Acceptable material: Panolam, Uniboard, Pionite, Tafista, Flakeboard.

.3 Poplar plywood (PP): to CSA O153, standard construction.

.4 Hardboard: to CAN/CGSB-11.3.

2.3 PLASTIC LAMINATES

.1 High pressure decorative laminates (HPDL): to NEMA LD3, general purpose grade HGS (1.2 mm), based on multilayered colour range with matt finish.

.2 Acceptable Manufacturer: Aborite

.1 Vertical Applications

.1 Colour: Allow for two colours from Standard Collection to be selected by Architect.

.2 Product type: Compact Grade for for high impact surfaces

.3 Laminate adhesive: water resistant, of type recommended by manufacturer.

2.4 ACCESSORIES

.1 Nails and staples: to ASTM F1667, type and size to suit application.

.2 Wood screws: steel, type and size to suit application.

.3 Splines: wood.

.4 Sealant: mildew resistant silicone, as specified in Section 07 92 00 - Joint Sealing.

.5 Decorative metal trim:

.1 Material: extruded aluminum alloy 6063-T5 temper

.2 Finish: Clear Anodized

.3 Type: profile as selected from manufacturer's standard range.

.4 Corner trim:

.1 Products:

.1 Fry Reglet: MWOC series

.2 Substitutions: See Section 01 25 13 – Product Substitution Procedures

.6 Glass: Fully tempered as specified in Section 08 80 00 – Glazing.

2.5 MANUFACTURED UNITS: LAMINATE CASEWORK

.1 Numbering system for unit types indicated on drawings in accordance with NAAWS Cabinet Design Series (CDS) system. Custom units where indicated.

.2 Fabricate casework to NAAWS Architectural Woodwork Standards, Section 10 - Casework, custom quality grade, flush overlay style, supplemented as follows.

.3 Laminate colours and patterns: selected by Consultant.

.1 Colours for semi-exposed surfaces, regardless casework grade specified shall be selected by Consultant.

.2 Grain direction for simulated woodgrain patterned laminates shall be vertical regardless of casework grade specified.

.4 Finishes:

.1 Exposed, semi-exposed, and concealed surfaces as as defined NAAWS Architectural Woodwork Standards, Section 10 - Casework.

.2 Definition: HPDL: High Pressure Decorative Laminate (i.e. laminated plastic).

.3 Definition: VGS: Vertical Surface Decorative Grade.

.4 All casework:

.1 Exposed surfaces: HPDL, VGS Grade.

.2 Semi-exposed surfaces (behind doors and drawer fronts): HPDL, VGS Grade.

.5 Furring, blocking, nailing strips, grounds and rough bucks and sleepers: softwood lumber, standard or better grade.

.6 Casework construction:

.1 Cabinet base:
  .1 Core: softwood plywood, B grade veneer, 19 mm thick.
  .2 Finish: HPDL, VGL grade, self-edge.
.2 Case bodies (ends, divisions and bottoms):
  .1 Core: particleboard, 19 mm thick and 6 mm thick for case backs.
  .2 Finish: HPDL, VGL grade, self-edge.
.3 Shelving:
  .1 Core: particleboard, not less than 19 mm thick.
  .2 Finish: HPDL, VGS grade, self-edge. Edge band all four edges of adjustable shelves.
.4 Drawers:
  .1 Sides and Backs:
    .1 Core: particleboard, 12 mm thick.
    .2 Finish: melamine, self-edge with melamine tape.
  .2 Bottoms:
    .1 Core: particleboard 6 mm thick.
    .2 Finish: melamine.
  .3 Fronts:
    .1 Core: particleboard, 19 mm thick.
    .2 Finish: HPDL, VGS grade; PVC edge banding.
.5 Casework Doors:
  .1 Core: particleboard, 19 mm thick.
  .2 Finish: HPDL, VGS grade; PVC edge banding.

2.6 COUNTERTOPS

.1 Refer to Section 12 36 00 – Countertops.

2.7 HARDWARE

.1 Hinges: to ANSI-A156.9, B01612 – concealed hinge, self-closing, 120 to 125 degree of opening, full overlay type for screw attachment complete with mounting plates.
  .1 Acceptable material:
    .1 Model 71T558 by Blum.
    .2 Model HD1311-552 by Mepla.
    .3 Model A00P94 by Salice.
    .4 Model 9956 by Hettich.
.2 Door and Drawer Pulls: back mount, 100 mm pulls, brushed nickel finish.
  .1 Acceptable material:
    .1 Richelieu, Collection BP56325128195T

.3 Drawer Slides For Drawers Up To 150 mm Deep but less than 406 mm wide: to ANSI-A156.9, B85051, side mount, steel construction, 3/4 extension, ball bearing operation, rail disconnect system, bright zinc finish, length as required.

.1 Acceptable material:

.1 Model 2037 by Accuride.

.2 Model 8150 by Knape & Vogt.

.3 Model LP KA3434 by Hettich.

.4 Drawer Slides for drawers deeper than 150 mm but less than 406 mm wide: to ANSI-A156.9, B85051, side mount, steel construction, full extension, ball bearing operation, bright zinc finish, length as required.

.1 Acceptable material:

.1 Model 3834 by Accuride.

.2 Model 8400 by Knape and Vogt.

.3 Model LP KA 5632 by Hettich.

.5 Shelf support pins: metal, nickel finish:

.1 Acceptable material: Richelieu 2291180 or equal.

.6 Shelf support pin sleeves: provide sleeve for each shelf support pin.

.1 Acceptable material: Richelieu 326ANO or equal.

.7 Cabinet locks: cam lock with plate, nickel finished. Keyed alike in groups. Confirm keying with Consultant.

.1 Acceptable material:

.1 Dom 225-240 Series, Richelieu

.2 CompX National

.3 Trimline

.8 Cable entry plugs (grommets): plastic, round, nominal 72 mm diameter, closing cover, colours selected by Consultant.

.1 Acceptable material: Richelieu 60091 or equal.

.9 Coat Rod:

.1 Coat Hanger Rod: stainless steel tube 32 mm diameter x 2 mm wall thickness. Lengths indicated. Matching wall flanges.

.1 Acceptable Product: K&V 660

.10 Glass Display Case: Sliding doors, adjustable glass shelving, and locking devises.

.1 Acceptable Manufacturer: C.R. Laurence

.2 Finish: Polished Chrome

2.8 HARDWOOD FINISHING MATERIALS

.1 Stain and Varnish Materials, satin finish: In compliance with AWMAC/WI (NAAWS), unless noted otherwise.

2.9 FABRICATION

.1 Shops install cabinet hardware for doors, shelves and drawers.

.2 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.

.3 Shelving in cabinetwork to be adjustable unless otherwise noted.

.4 Space gables, legs or brackets supporting countertops at not more than 1070 mm on centre, unless otherwise indicated.

.5 Provide equal width filler panels at both ends of cabinet runs; maximum width 50 mm.

.6 Provide cut outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.7 Shop assembles work for delivery to site in size easily handled and to ensure passage through building openings.

.8 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.9 Ensure adjacent parts of continuous laminate work match in colour and pattern.

.10 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cut outs.

.11 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.12 Apply laminate backing sheet to reverse side of core of plastic laminate work.

2.10 SHOP FINISHING

.1 Sand work smooth and set exposed nails.

.2 On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.

.3 Finish work in accordance with AWMAC/WI (NAAWS), Section 5 – Finishing for grade specified and as follows:

.1 Transparent:

.1 System – 5, Varnish, Conversion

.2 Stain: As selected by Consultant

.3 Sheet: Satin

Part 3 Execution

3.1 INSTALLATION

.1 Do architectural woodwork to NAAWS, except where specified otherwise.

.2 Install millwork at locations shown on drawings. Position accurately, level, plumb straight.

.3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.

.4 Use draw bolts in countertop joints.

.5 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.6 Provide cut outs for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.

.7 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

.8 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.

3.2 CABINET HARDWARE

.1 Fit hardware accurately and securely in accordance with manufacturer's written instructions

.2 Adjust cabinet hardware for optimum, smooth operating condition.

.3 Lubricate hardware and other moving parts.

.4 Adjust cabinet door hardware to provide tight fit at contact points with frames.

3.3 CLEANING

.1 Clean inside cupboards and drawers, and outside surfaces.

.2 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.3 Perform care and cleaning of plastic laminate surfaces with NEMA LD 3, Annex B.

.4 Remove excess glue from surfaces.

3.4 PROTECTION

.1 Protect cabinet work from damage until final inspection.

.2 Cover finished surfaces with heavy kraft paper or put in cartons during shipment. Protect surfaces by approved means. Do not remove until immediately before final inspection.

END OF SECTION

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Part 1 GENERAL

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

.2 Section Includes:

.1 Plastic wall liner panels.

.2 Plastic ceiling panels.

.3 Related Sections:

.1 Division 06: Rough and Finish Carpentry.

.2 Division 09: Special Wall Surfacing

1.2 REFERENCES

.1 Canadian Food Inspection Agency (CFIA) Approval

.2 ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

.3 S102.2-18 Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials and Assemblies

.4 ASTM D4226 -Standard Test Method for Impact Resistance

.5 California Department of Public Health (CPDH) - Standard Method for the Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers Version 1.2

.6 ASTM G21-Standard Test Method Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

.7 City of Los Angeles Research Report: RR 26036

1.3 SUBMITTALS

.1 Submit under provisions of Section 01 30 00 "Submittals".

.2 Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:

.1 Preparation instructions and recommendations.

.2 Installation means and methods.

.3 Recommendations and requirements for proper storage and handling.

.3 Shop Drawings: Provide layout of panels for all walls and ceilings for approval by consultant. Include layout dimensions, profiles, product components, anchorage details, track mounting and support, and interface with adjoining construction.

.1 Submit Manufacturer's approved shop drawings detailing the section and elevation views of each product to be installed.

.2 Coordinate with locations listed on Contract Drawings.

.4 Verification Samples: Provide two samples of specified product, representing actual color, finish, and patterns.

.5 Informational Submittals:

.1 Installer qualifications.

.2 Product test reports.

.3 Sample warranties.

.6 Closeout Submittals:

.1 Maintenance data for installed system.

1.4 QUALITY ASSURANCE

.1 Manufacturer's Qualifications: Primary products shall be manufactured and supplied by a single manufacturer.

.2 Installer Qualifications: Products shall be installed by a single installer with demonstrated experience in installing products of the same type and scope as specified.

.3 Mock-Up: Arrange for the construction of a mock-up of the products specified in this section for evaluation of surface preparation techniques and application workmanship.

.1 Finish areas designated by Architect.

.2 Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

.3 Refinish mock-up area as required to produce acceptable work

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials and products in accordance with the manufacturer's instructions and recommendations and industry standards.

.2 Store all materials in the manufacturer's original packaging until 24 hours prior to installation.

.3 Store materials flat, and in a clean, dry area indoors in accordance with manufacturer's instructions.

.4 Store materials in the location where they will be installed for no less than 24 hours prior to installation; to minimize post-installation expansion or contraction and ensure the best possible installation. Loosen or remove any packaging material that may restrain the product while acclimatizing.

1.6 PROJECT CONDITIONS

.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under

environmental conditions outside manufacturer's absolute limits. Panels should be installed in an environment where panels have been acclimatized to a temperature between 50 degrees F and 68 degrees F (10 degrees C and 20 degrees C) for at least 24 hours before installation.

.2 Prior to fabrication, verify that dimensions are consistent with those found in the construction drawings. Where discrepancies exist, confirm the proper dimensions with the Architect before proceeding with work.

.3 Cold Temperatures – Do NOT install panels at temperature at or below 32 degrees F (0 degrees C).

1.7 WARRANTY

.1 Warranty: Manufacturer agrees to replace or refund the purchase price of nonconforming PVC panels and trim defective in material or workmanship within the specified warranty period of twenty (20) years or lifetime upon registration.

Part 2 PRODUCTS

2.1 MANUFACTURERS

.1 Basis of Design Manufacturer: Wall and Ceiling Board by Trusscore Inc.
Website: https://trusscore.com

.2 Performance Requirements

.1 Physical Performance:

.2 Impact Resistance: Minimum 2.08 In-I/mil in according to ASTM D4226.

.3 Coefficient of Thermal Expansion: Maximum 5.7 x 10-5 in/in/°F; according to ASTM D696.

.4 Material Density: Density rating of 1.46 according to ASTM D792.

.5 Tensile Strength: Minimum of 6575 psi rating according to ASTM D638.

.6 Surface-Burning Characteristics: Meet the following values according to ASTM E84 and CAN/ULC-S102:

.7 ASTM E84 Class A Flame-Spread Index: 15.

.8 CAN/ULC-S102 Class A Flame-Spread Index: 10.

.9 ASTM E84 Smoke Developed Index: 450.

.10 CAN/ULC-S102 Smoke Developed Index: 380.

.3 Environmental Performance:

.1 Food Processing Facilities: CFIA approved and compliant with FDA and USDA guidelines.

.2 Fungus Resistance: Pass; Growth rating of 0 according to ASTM G21 and ISO 846:2019. Boards do not contain cellulosic material.

.4 Waterproof; nonporous.

.5 Corrosion Proof

.6 Sustainability Performance:

.1 Low VOC Emissions: Meets 01350 Standard Method for the Evaluation of Volatile Organic Chemical Emissions from Indoor Sources in accordance with California Department of Public Health (CPDH) to comply with LEED's Low-Emitting Materials category.

.2 Light Reflectivity: 0.88 LRV to comply with LEED's Interior Lighting category.

.3 Material Recovery: Provide PVC products that are 100% recyclable to comply with LEED's Construction and Demolition Waste Management & Waste Management Planning & Interiors Life Cycle Impact Reduction categories.

2.2 PRODUCT

.1 PVC Wall Panels

.1 Basis-of-Design Product: Trusscore Wall&Ceiling Board, by Trusscore Inc.

.2 General: Provide Tongue-and-groove, Rib-reinforced PVC panel with nailing fins.

.3 Material: PVC;

.1 Outside Surface: Flat.

.2 Width: 406mm.

.3 Length: 3657.6mm

.4 Thickness: 13mm.

.5 Weight: 3.9 kgf/m^2 (0.8 PSF)

.6 Color: White

.2 PVC Ceiling Panels

.1 General: Provide Tongue-and-groove, Rib-reinforced PVC liner panel with nailing fins.

.2 Material: PVC;

.1 Outside Surface: Flat.

.2 Width: 406mm.

.3 Length: 3657.6mm.

.4 Thickness: 13mm.

.5 Weight: 3.9 kgf/m^2 (0.8 PSF)

.6 Color: White

.3 Accessories

.1 Basis-of-Design Product: Trusscore PVC Trim, by Trusscore Inc.

.1 Description: all trims recommended by manufacturer for installation.

.1 Material: PVC;

.2 Color: White

Part 3 EXECUTION

3.1 EXAMINATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces for painting and installation using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 INSTALLATION

.1 Wall Panels: Install PVC panels in accordance with manufacturer's instructions at locations indicated on the Drawings.

- .1 Ensure panels are plumb, level, square, and in proper alignment.
- .2 Anchor wall panels with construction adhesive and fasteners in accordance with manufacturer's instructions.

.2 Ceiling Panels: Install PVC panels in accordance with manufacturer's instructions at locations indicated on the Drawings.

- .1 Ensure panels are flat, level, square, and in proper alignment.
- .2 Anchor ceiling panels with appropriate fasteners accordance with manufacturer's instructions.

.3 High Moisture Environment Installation:

- .1 Apply silicone sealant inside the grooved end of the panel prior to inserting the next panel.
- .2 Ensure that drainage pathways are created in trim pieces, in accordance with manufacturers written instructions.

.4 Fasteners: Corrosion resistant No. 8 or No. 10 gauge screws with a flat-bottomed, low-profile head and a minimum head diameter of 3/8 Inch.

- .1 Fastening into Wood: Stainless Steel or Zinc coated, 1-1/4 Inch, No. 10 or No. 8 round washer or truss screws.
- .2 Fastening into Metal Studs: Self-tapping, stainless steel or zinc coated, 1-1/4 Inch, No. 10 or No. 8 round washer or truss screws.
- .3 Fastening into Masonry: Stainless steel, corrosion resistant, 3/16-inch x 1-1/4 Inch flathead concrete screws.
- .4 Install fasteners in pre-punched holes 16 inches to 24 inches (406mm - 610mm) on center into screw flange.
- .5 Ensure screw flange lays flat against surface, between screw head and substrate, not deformed around screw heads.
- .6 Do not recess screw heads into nailing fins.
- .7 Ensure fasteners are not exposed.
- .8 When applying over drywall, screws should be 1-3/4 Inch to 2 Inches long. If furring strips or strapping are part of your installation, screws should be 2-1/2 Inches.

.9 For highly corrosive or moist environments, use stainless-steel screws.

.5 Cutting Panels:

.1 Field-cut panels as necessary in accordance with manufacturer's instructions.

.2 Ensure cuts are straight, square, and do not damage panels.

3.3 CLEANING AND PROTECTION

.1 Clean surfaces with a mild detergent or soap scum remover.

.2 In cases when hand cleaning is not satisfactory, pressure washers may be used with mild soap and a sponge or soft cloth, provided the guidelines below are followed:

.1 Power washing nozzle should be at least 4-6 ft away from the wall.

.2 Use a small-to mid-size power washer with less than 3,000 psi.

.3 Use a wide spray nozzle angle (40° or greater is preferred) to distribute the water pressure across the wall.

.3 Multi-purpose cleaners may be used, provided they are PVC compatible. Spot test material in an inconspicuous location prior to cleaning.

.4 Provide final protection and maintain conditions that ensure that products are without damage or deterioration at time of Substantial Completion.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Bituminous dampproofing.

REFERENCE STANDARDS

.1 ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free 2007, with Editorial Revision (2012).

SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide properties of primer, and mastics.

SITE CONDITIONS

.1 Maintain ambient temperatures above 5 degrees C for 24 hours before and during application until dampproofing has cured.

Part 2 Products

2.1 BITUMINOUS DAMPPROOFING

.1 Bituminous dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.

.1 Composition: ASTM D4479/D4479M Type I, minimum, asbestos free.

.2 VOC Content: Not more than permitted by local, provincial, and federal regulations.

.3 Applied thickness: 1.5 mm, minimum, wet film.

.4 Products:

.1 Henry Company; 710-11.

.2 W.R. Meadows; Sealmastic 505.

.3 Substitutions: See 01 25 13 - Product Substitution Procedures.

.2 Primers, mastics, and related materials: Type as recommended by dampproofing manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions are acceptable prior to starting this work.

.2 Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

.3 Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.2 PREPARATION

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.1 Protect adjacent surfaces not designated to receive dampproofing.

.2 Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

.3 Seal around penetrations through dampproofing with sealing compound and reinforcing fabric before applying dampproofing.

.4 Do not apply dampproofing to surfaces unacceptable to manufacturer.

.5 Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.3 APPLICATION

.1 Grade beams: Apply two coats of asphalt dampproofing.

.2 Prime surfaces at a rate approved by manufacturer for application indicated and allow primer to dry thoroughly.

.3 Apply bitumen with roller.

.4 Apply from 50 mm below finish grade elevation down to bottom of grade beams.

.5 Seal items watertight with mastic, that project through dampproofing surface.

END OF SECTION

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Part 1 GENERAL

1.01 GENERAL REQUIREMENTS

.1 The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division 01 General Requirements shall be read in conjunction with and govern this section.

.2 The Specification shall be read as a whole by all parties concerned. Sectioning of the Specification is for convenience. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.

1.02 DESCRIPTION

.1 Supply labor, materials, plant, tools and equipment to complete the Work as shown on the Drawings and as specified herein including, but not limited to the following:

.1 Foundation Walls

.2 Primer & Self-Adhered SBS Modified Asphalt Waterproofing Membrane,

.3 Drain Board/Protection Board,

.4 Specified Backfill.

1.03 RELATED WORK

.1 Division 2 Site Work

.2 Division 3 Concrete

.3 Division 4 Masonry

.4 Division 5 Structural Steel

.5 Division 6 Rough Carpentry

.6 Division 7 Sealants & Flashings

.7 Division 15 Mechanical

1.04 REFERENCES

.1 CAN/CGSB-37.9M: Primer, Asphalt, Unfilled for Asphalt Roofing, Dampproofing and Waterproofing.

1.05 SUBMITTALS

.1 Prior to commencing the Work, submit copies of manufacturers current certification to ISO. Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.

.2 Prior to commencing the Work, submit references clearly indicating that the materials proposed have been installed for not less than fifteen years on projects of similar scope and nature. Submit references for a minimum of ten projects.

.3 Prior to commencing the Work submit manufacturers complete set of standard details for waterproofing systems.

1.06 QUALTIY ASSURANCE

.1 Perform Work in accordance with the printed requirements of the membrane manufacturer and this specification. Advise designer of any discrepancies prior to commencement of the Work.

.2 Maintain one copy of manufacturers literature on site throughout the execution of the Work.

.3 At the beginning of the Work and at all times during the execution of the Work, allow access to site by the waterproofing membrane manufacturers representative.

.4 Materials used in this Section, including, primers, mastics and membranes, asphaltic protection boards, composite drainage boards and expansion joint membranes shall be fully compatible and shall be sourced and or produced by one manufacturer.

.5 Submit copies of the membrane manufacturers current ISO certification including the manufacturing of the membrane, primer, mastics, adhesives and protection board.

1.07 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

.2 Cold applied elastomeric membrane should be stored in closed containers outdoors.

.3 Store membrane at temperature of 40 degrees F and above to facilitate handling.

.4 Membrane contains petroleum solvents and are flammable. Do not use near open flame.

.5 Store role materials horizontally in original packaging.

.6 Store adhesives and primers at temperatures of 40 degrees F and above to facilitate handling.

.7 Keep solvents away from open flame or excessive heat.

1.08 COORDINATION

.1 Ensure continuity of the waterproofing membrane throughout the scope of this section.

.2 Work shall be so scheduled as to provide a watertight seal at the end of each working day on the areas worked upon during the day.

1.09 SITE CONDITIONS

.1 Environmental Requirements

.1 No installation work shall be performed during rainy or inclement weather and on frost or wet covered surfaces.

.2 Protection

.1 Provide adequate protection of materials and work of this section from damage by

weather backfilling operations and other causes.

.2 Protect work of other trades from damage resulting from work of this section. Make good such damage at own expense to satisfaction of the consultant.

.3 Apply protection board as soon as possible after installation of membrane.

1.10 ALTERNATES

.1 Submit requests for alternates in accordance with Section 13 18 04.

.2 Alternate submission format to include:

.1 Submit evidence that alternate materials meet or exceed performance characteristics of Product requirements and documentation from an approved independent testing laboratory certifying that the performance of the waterproofing membrane system including drain boards and transition sheets, exceed the requirements of the National Building Code.

.2 Submit copies of manufacturers' current ISO certification.

.3 Submit references clearly indicating that the membrane manufacturer has successfully completed projects on a annual basis of similar scope and nature for a minimum of fifteen years.

.4 Submit manufacturers' complete set of standard details for the waterproofing membrane systems showing a continuous plane of water tightness throughout the building envelope.

.3 Submit requests for alternate to this specification a minimum of fifteen (10) working days prior to tender closing for evaluation. Include a list of 25 projects executed over the past fifteen years.

.4 Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.

1.11 WARRANTY

.1 For the Work of this Section, the 12 months warranty period prescribed in subsection GC 32.1 of General Conditions "C" is extended 24 months.

.2 Waterproofing membrane manufacturer hereby warrants that the waterproofing membrane for leak coverage as a result of faulty materials for a period of ten years [five years for single ply without Henry DB Drain Board). Scope of warranty shall include materials required to return the membrane to a watertight condition.

Part 2 PRODUCTS

2.01 MATERIALS

.1 Waterproofing membrane components and accessories must be obtain as a single-course from the membrane manufacturer to ensure total system compatibility and integrity.

.1 Acceptable Manufacturer: Henry Company
909 N Sepulved Blvd, suite 650
El Segundo, CA 90245

(800) 598 7663

.2 WATERPROOFING MEMBRANE (Basis-of-Design)

.1 Primary sheet applied self-adhered waterproofing membrane shall be Blueskin® WP200 manufactured by Henry, 1.5mm (60 mils) SBS modified bitumen, self-adhering sheet membrane with a cross-laminated polyethylene film, and having the following physical properties:

.1 Thickness: 1.5 mm (60 mils) min.,

.2 Flexibility: Pass @ -40 degrees C to ASTM D1970

.3 Vapour permeance: 2.8 ng/Pa.s.m² (0.05 perms) to ASTM E96,

.4 Tensile strength (membrane): 2.24 MPa to ASTM D412,

.5 Tensile strength (film): 34.5 MPa to ASTM D882,

.6 Elongation: 300% to ASTM D412,

.7 Puncture resistance: 222 N min. to ASTM E154.

.3 PRIMER

.1 Primer for self-adhering membranes at temperatures above 25 degrees F shall be Aquatac™ Primer manufactured by Henry, a polymer emulsion based adhesive, quick setting, having the following physical properties:

.1 Colour: Aqua;

.2 Weight: 8.7 lbs/gal;

.3 Solids by weight: 53%;

.4 Water based, no solvent odours

.5 Drying time (initial set): 30 minutes at 50% RH and 70 degrees F;

.4 LIQUID MEMBRANE & TERMINATION SEALANT

.1 Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:

.1 Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,

.2 Complies with Fed. Spec. TT-S-00230C, Type II, Class A

.3 Complies with ASTM C 920, Type S, Grade NS, Class 25

.4 Elongation: 450 – 550%

.5 Remains flexible with aging

.6 Seals construction joints up to 1 inch wide

.5 PREFABRICATED DRAIN BOARDS: Two part prefabricated geocomposite drain board consisting of a formed polystyrene or PVC core covered on one side with a woven or non-woven polypropylene filter fabric:

.1 Henry DB 200: For vertical and horizontal installations, shallower depths.

.2 Henry DB 500: For vertical installations requiring high compressive strength and high flow capacity.

.3 Henry DB 650: For horizontal applications requiring high compressive strength, high flow capacity & woven geotextile. Suitable for use under topping slab in split slab applications.

.6 PREFABRICATED DRAIN BOARD ACCESSORIES

.1 Securement Bars: Continuous 1/4 inch x 3/4 inch HDPE bar for screw attachment.

.2 Moulding Strip: Continuous 3 ½ inch wide 'Z' flashing strip to fit over exposed top edge of drain board.

.3 Drain Board Plugs & Nails: HDPE pre-moulded washer to fit dimples c/w high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.

.7 INSULATION

.1 Minimum thermal resistance (R-Value): Project specific Minimum R-Value

.2 Compressive Strength: 60 psi.

.3 Insulation supplied by Henry a Carlisle Company

.1 Accepted Manufacturers:

.1 Expanded polystryrene (EPS)

.1 Insulfoam® a Carlisle Company

.2 Extruded polystyrene (XPS)

.1 DOW®

.2 Owens Corning®

PART 3 EXECUTION

3.01 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

3.02 PREPARATION

.1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, frost or other contaminants. Fill spalled areas in substrate to provide an even plane.

.2 New concrete should be cured for a minimum of 7 days and must be dry before waterproofing membranes are applied. Lightweight structural concrete must be cured a minimum of 14 days.

.3 Use appropriate waterproofing membrane primer as recommended by manufacturer based on air and surface temperature at time of application.

3.03 PRIMER

.1 Apply primer for self-adhered membrane by roller or spray at rate recommended by manufacturer.

.2 Allow minimum 30 minute open time. Primed surfaces not covered by waterproofing membrane during the same working day must be re-primed.

3.04 FOOTING/FOUNDATION WALLS, JUNCTURES, CRACKS IN SLAB AND PROTRUSIONS

.1 Coat penetrations, such as brackets, clips, braces, etc. that are set into the concrete with a 90 mil coating of liquid membrane to the height of the wearing course and around projections to ensure a complete seal prior to coating the entire area.

.2 To all cracks and cold joints less than 1/16 inch, apply a coat of liquid membrane at a minimum thickness of 30 mils extending 3 inches on either side of joint, embed a 6 inch wide strip of primary self-adhered waterproofing membrane over.

.3 To all cracks greater than 1/8 inch, fill void with non-shrink cementitious patching material and allow to cure dry. Prime area and install self-adhered waterproofing membrane, extend 3 inches on either side of crack. Overlap end joint of sheet a minimum 3 inches.

.4 At monolithic and non-monolithic wall/slab junctures, prime area, trowel-in fillet bead of liquid membrane to inside corners and install self-adhered waterproofing membrane sheet to the required height on the wall and at least 4 inches on the slab. Lap primary waterproofing membrane over a minimum of 2 inches.

.5 Horizontal to vertical inside corner transition areas are to be pre-treated with a liquid membrane fillet extending 3/4 inch vertically and horizontally from the corner. Apply a minimum 10 inch strip of self-adhered waterproofing membrane centred at the joint.

.6 All outside corners are to be pre-treated with a minimum 10 inch strip of waterproofing membrane centred at the joint.

.7 Where three or more planes come into contact reinforce with cut sections of waterproofing membrane reinforcing sheet as per manufacturer's instructions.

3.05 PROJECTIONS

.1 Extend waterproofing membrane tight to projection and seal with liquid membrane extending 3 inches along projection and 3 inches onto waterproofing membrane.

3.06 WATERPROOFING MEMBRANE - VERTICAL APPLICATIONS

.1 Apply waterproofing membrane to prepared substrate in lengths of 6 feet or less.

.2 Provide 3 inch laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place. Promptly roll all laps with a countertop roller to effect seal. If more than one length is required on a vertical surface, apply in a shingle fashion.

.3 Terminate membrane using termination mastic or termination bar, reglet or counter flashing as indicated. Refer to manufacturers standard details.

.4 All laps within 12 inches of a 90 degrees change in plane are to be sealed with termination sealant.

3.07 WATERPROOFING MEMBRANE - HORIZONTAL APPLICATIONS

.1 Apply 2 plies of waterproofing membrane to prepared substrate in lengths of 6 feet or less.

.2 Provide 3 inches laps at both sides and ends. Position for alignment and remove

protective film. Press firmly into place. Promptly roll all laps with a countertop roller to effect seal. If more than one length is required on a vertical surface, apply in a shingle fashion.

.3 Terminate membrane using termination mastic or termination bar, reglet or counter flashing as indicated. Refer to manufacturers standard details.

.4 All laps within 12 inches of a 90 degrees change in plane are to be sealed with termination sealant.

3.08 INSTALLATION OF PROTECTION BOARD

.1 Protection Boards shall be installed over the waterproofing membrane to prevent damage from materials used in backfilling.

.2 Apply protection board adhesive in 1 inch wide strips spaced at 16 inches o/c to cure waterproofing membrane. Immediately embed protection board and press into adhesive to ensure full contact.

.3 Do not backfill until adhesive has cure dried. Do not use excessive levels of adhesive.

3.09 INSTALLATION OF DRAIN BOARD (Vertical)

.1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be in moderate contact with weeping tile system.

.2 Secure drainage board to foundation wall with nails and washers spaced 450 mm o/c horizontally. Install minimum of 2 rows staggered and spaced 6 inches apart and min 6 inches from top edge.

.3 Align and install termination strip along top edge with nails spaced 12 inches o/c and seal with termination sealant.

.4 Align and install moulding strip over completed top edge detail.

.5 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.6 Bend drain board to create inside corners and cut board to create outside corners, provide 4 inches of extra fabric to wrap corner.

.7 Stagger or offset joints of drain board sheets.

.8 Place all subsequent sheets in an overlapping single fashion.

.9 Backfill bottom edge in conjunction with weeping tile system.

3.10 INSTALLATION OF DRAIN BOARD (Horizontal)

.1 The edge of the core flange shall be at the higher edges of the substrate, away from drains.

.2 Overlap in the direction of water flow. Pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.3 Bend drain board to create inside corners and cut board to create outside corners, provide

3 inch of extra fabric to wrap corner.

.4 Stagger or offset joints of drain board sheets.

.5 Place all subsequent sheets in an overlapping single fashion.

3.11 CLEAN-UP

.1 Promptly as the work proceeds and on completion clean up and remove from site all rubbish and surplus materials resulting from the foregoing work.

3.12 PROTECTION

.1 Protect waterproofing membrane and drain board work from other trades during construction.

.2 Backfill with specified materials, protect membrane from damage.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Crystalline waterproofing.

.2 Preparation of surfaces to be waterproofed, including plugging active water leaks.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-in-Place Concrete: Concrete work to be waterproofed.

1.3 REFERENCE STANDARDS

.1 COE CRD-C 48 - Method of Test for Water Permeability of Concrete 1992.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Manufacturer's data sheets on each product to be used, including:

.1 Test data showing hydraulic permeability.

.2 Preparationacc instructions and recommendations.

.3 Storage and handling requirements and recommendations.

.4 Installation methods.

.5 Details for waterproofing at joints, intersections, and other special conditions.

.3 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Acceptable to manufacturer, with documented experience on at least five projects of similar nature within last five years.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Store products in manufacturer's unopened packaging until ready for installation.

.2 Take necessary precautions to keep cementitious materials dry.

1.7 SITE CONDITIONS

.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results; do not install products under environmental conditions outside manufacturer's absolute limits.

Part 2 Products

2.1 APPLICATIONS

.1 Waterproofing for building surfaces:

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.1 Horizontal and vertical surfaces inside of elevator pits.

2.2 MATERIALS

.1 Crystalline waterproofing: Portland cement and chemical compound that when applied to surface of concrete forms insoluble crystals in capillary pores preventing passage of liquids, while having no adverse effect on normal properties of concrete.

.1 Hydraulic permeability: No measurable leakage or water flow at pressure of 123.4 m of head or 1.2 MPa when tested in accordance with COE CRD-C 48.

.2 Toxicity: Non-toxic.

.3 Colour: Grey.

.4 Acceptable Products:

.1 Kryton International Inc.; Krystol T1/T2 Slurry.

.2 Master Builders Solutions; MasterSeal 500.

.3 Tremco Commercial Sealants

.4 Waterproofing; Permaquik Super 200.

.5 W.R. Meadows, Inc.; Cem-Kote CW Plus.

.6 Xypex Chemical Corporation; Xypex Concentrate.

.7 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

.2 Accessory materials: compatible with primary waterproofing materials, including but not necessarily limited to:

.1 Structural repair mortar: To form coves, fill cracks and honeycombs, fill form tie holes, fill reglets formed over construction joints.

.2 Thin patching mortar: for thin repairs and bugholes.

.3 Plugging material: Hydraulic cement, purpose-made for stopping active water leaks.

.4 Reinforcing fabric: non-woven, for crack treatment.

.5 Water: Potable, clean, free from salt.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin installation until substrates have been properly prepared.

.2 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under project conditions, and use sand blasting, water blasting, or acid etching as recommended.

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.3 Plug water leaks.

.4 Patch holes, construction joints, and cracks; remove defective concrete.

.5 Obtain approval of manufacturer's site representative before beginning installation.

3.3 INSTALLATION

.1 Install in strict accordance with manufacturer's instructions, maintain environmental conditions required and recommended by manufacturer, and keep a copy of manufacturer's instructions on site.

.2 Coordinate installation with installation of products that must penetrate waterproofed surfaces.

.3 Prevent excessive drying of surface.

.1 Cure waterproofing for at least three days, or length of time required by manufacturer, with water spray and adequate air circulation.

.2 Do not use chemical curing agents unless explicitly approved by waterproofing manufacturer.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs and rink slabs, and exterior wall behind metal wall finish.

.2 Batt insulation in exterior parapet construction.

1.2 RELATED REQUIREMENTS

.1 Section 07 05 43 - Cladding Support System: Thermal clips

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing: Insulation specified as part of roofing system.

.3 Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.3 REFERENCE STANDARDS

.1 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

.2 ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics 2016.

.3 ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics 2012.

.4 CAN/ULC S102 - Method of Testing for Surface Burning Characteristics of Building Materials and Assemblies 2018.

.5 CAN/ULC S114 - Test for Determination of Non-Combustibility in Building Materials 2018.

.6 CAN/ULC S701.1 - Standard for Thermal Insulation, Polystyrene Boards 2017.

.7 CAN/ULC S702.1 - Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification 2021.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Provide data on product characteristics, performance criteria, and product limitations.

1.5 SITE CONDITIONS

.1 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

Part 2 Products

2.1 APPLICATIONS

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.1 Insulation under concrete slabs: Extruded polystyrene (XPS) load-bearing board insulation.

.2 Insulation at perimeter of foundation walls: Concrete-faced extruded polystyrene (XPS) board.

.3 Exterior wall insulation: Fibrous mineral fibre semi-rigid insulation board.

.4 Parapets: Batt insulation.

2.2 BOARD INSULATION MATERIALS

.1 Extruded polystyrene (XPS) foundation wall board insulation: Complies with CAN/ULC S701.1 with either natural skin or cut cell surfaces.

.1 Type and compressive strength: Type 4, 210 kPa, minimum, in accordance with ASTM D1621.

.2 Water absorption: 0.7 percent by volume, maximum, in accordance with ASTM D2842.

.3 Board size: 610 mm by 1220 mm.

.2 Extruded polystyrene (XPS) perimeter foundation wall board insulation: Premanufactured concrete-faced extruded polystyrene foam insulation manufactured in accordance with CAN/ULC S701.1.

.1 Type and compressive strength: Type 3, 140 kPa, minimum, in accordance with ASTM D1621.

.2 Thermal resistance: RSI-value of 1.62, minimum, per 50 mm thickness.

.3 Water absorption: 0.7 percent by volume, maximum, in accordance with ASTM D2842.

.4 Board size: 610 mm by 1220 mm.

.5 Board thickness: 100 mm not including facing.

.6 Face: 8 mm thick latex-modified concrete facing, grey colour with broom-textured finish.

.7 Installation accessories, including system components and accessories required for a complete installation.

.1 Steel mounting clips: Galvanized steel, 275 coating to ASTM A653/A653M.

.3 Extruded polystyrene (XPS) load-bearing board insulation: Load-bearing, closed-cell extruded polystyrene foam insulation manufactured in accordance with CAN/ULC S701.1.

.1 Type and compressive strength: Type 4, 415 kPa, minimum, in accordance with ASTM D1621.

.2 Water absorption: 0.7 percent by volume, maximum, in accordance with ASTM D2842.

.3 Board size: 610 mm by 1220 mm.

.4 Board thickness: As indicated on Drawings.

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.4 Fibrous mineral insulation: Preformed semi-rigid mineral fibre board insulation manufactured in accordance with CAN/ULC S702.1.

.1 Type: 1, unfaced.

.2 Thermal resistance: RSI-value of 0.70, minimum, per 25 mm thickness.

.3 Combustibility and surface burning characteristics: Rated non-combustible in accordance with CAN/ULC S114 and having flame-spread rating (FSR) of 0 to 25 and smoke developed classification (SDC) of 0 to 50 in accordance with CAN/ULC S102.

.4 Board edges: Square.

.5 Board size: 610 mm by 1220 mm.

.6 Board thickness: Thickness required to achieve insulation value indicated on Drawings, installed in two layers.

2.3 BATT INSULATION MATERIALS

.1 Mineral fibre batt insulation: Flexible or semi-rigid preformed batt or blanket, complying with CAN/ULC S702.1; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with CAN/ULC S102.

2.4 ACCESSORIES

.1 Adhesive: Type recommended by insulation manufacturer for application.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

.2 Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT FOUNDATION PERIMETER

.1 Install concrete-faced XPS insulation on grade beams to 600 mm below finished grade using manufacturer's recommended fastening system.

.1 Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

.2 Fasten concrete-faced insulated panels to structural supports; aligned level and plumb.

.3 Install panels with vertical joints and panel control joints in alignment.

.4 Cover exposed insulation at corners and top of perimeter insulation with prefinished flashing as specified in Section 07 62 00.

.2 Install XPS insulation on grade beams below concrete-faced XPS insulation to bottom of grade beams.

.3 Install XPS frost barrier insulation extending away from foundation walls to extent

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indicated

.4 Prevent insulation from being displaced or damaged during backfilling.

3.3 BOARD INSTALLATION AT EXTERIOR WALLS

.1 Install boards horizontally on walls to fit snugly between thermal clips or masonry veneer anchors.

.2 Apply daubs of adhesive to back of boards to temporarily hold insulation in place while exterior furring and metal cladding and phenolic cladding is being installed.

.3 At masonry veneer walls, hold insulation place using polyethylene insulation support installed on masonry anchors before V-tie is installed.

.4 Install insulation in two layers. Install boards with joints staggered between layers.

.1 Install in running bond pattern.

.2 Butt edges and ends tightly to adjacent boards and protrusions.

.5 Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.4 BOARD INSTALLATION UNDER CONCRETE SLABS

.1 Place insulation under slabs on grade after base for slab has been compacted.

.2 Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

.3 Prevent insulation from being displaced or damaged while placing vapour retarder, refrigeration piping and placing slab.

3.5 BATT INSTALLATION

.1 Install insulation in accordance with manufacturer's instructions.

.2 Install in exterior parapet spaces without gaps or voids. Do not compress insulation.

.3 Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

.4 Fit insulation tightly in cavities.

3.6 PROTECTION

.1 Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Board insulation with embedded plywood batten and drainage cap, for cavity wall and roofing construction.

.2 Related Accessories.

1.2 RELATED REQUIREMENTS

.1 Section 04 20 00 – Unit Masonry.

.2 Section 07 26 00 – Vapour Retarders.

.3 Section 07 27 00 – Air Barriers.

.4 Section 07 61 00 – Sheet Metal Roofing.

.5 Section 07 62 00 – Sheet Metal Flashing.

1.3 REFERENCES

.1 CAN/ULC S102.2 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, And Miscellaneous Materials And Assemblies.

.2 CAN/ULC S701-05 - Thermal Insulation of Polystyrene, Panels and Piping Coatings.

.3 CAN/ULC S705 - Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density – Material.

.4 ASTM C203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.

.5 ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

.6 ASTM C1363 – Standard Test Method for Thermal Performance and Building Materials and Envelope Assemblies.

.7 ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

.8 ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.

.9 ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

.10 ASTM D2863 - Standard Test Method for Measuring the Minimum Oxygen

.11 Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).

.12 ASTM D3816 - Standard Test Method for Water Penetration Rate of Pressure-Sensitive Tapes.

.13 ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on product characteristics, performance criteria, and limitations

.3 Installation Data: Indicate special environmental conditions required for installation, installation techniques.

.4 Shop Drawings: Indicate material, thickness, fastening methods, terminations, roof assembly components and installation details. Shop drawings shall bear the seal of an engineer registered in the Province of Manitoba for review prior to fabrication.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section [01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in a covered area, away from the elements, direct sunlight and extreme heat.

.2 Store and protect product from damage. Caution to be taken with corners and edges from damage during transport, storage and installation.

.3 Replace defective or damaged materials with new.

.4 Do not walk on product.

.5 Keep away from extreme heat.

.4 Packaging and Waste Management:

.1 Separate and recycle waste packaging materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

.2 Remove waste packaging materials from site and dispose of packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 MANUFACTURER

.1 Acceptable Manufacturer: Quik-Therm located at 1680 Sargent Ave., Unit 3 Winnipeg, MB Canada, R3H 0C2; Toll Free: 1-888-735-3012, Telephone: 204-736-3012; Email; info@quiktherm.com, Website; www.quiktherm.com.

2.2 EXPANDED POLYSTYRENE INSULATION – FACED WITH EMBEDDED PLYWOOD BATTEN

.1 Expanded Polystyrene Insulation (Faced): Quik-Therm Air Dry Connect.

.2 Description:

.1 Type II closed cell expanded polystyrene (EPS) with perforated metalized polymer facers. Inboard facer includes 5 mm (3/16”) deep by 330 mm (13”) wide drainage channels for 75% panel surface area. Outboard facer includes 19 mm(3/4”) thick x 60 mm(2-3/8”) wide machined plywood battens embedded into the insulation panels, and hermetically sealed in place with permeable metalized polymer facer. Embedded plywood battens spaced 400mm (16 inch) on centre. Board edges 13mm(1/2”) x 13mm(1/2”) tongue and groove connection. Board Size: 1.2 m(4’) x 2.4 m(8 feet), Thickness; 100mm (4 inch).

.2 Does not contain dyes, formaldehyde or blowing agents. It may contain up to 15% recycled (EPS).

.3 Physical Properties:

CHARACTERISTIC	UNITS	NOMINAL VALUE	TEST METHOD
Dimensional Stability – Maximum Linear Change	%	1.5	ASTM D2126
Length Tolerance	mm (in)	+/- 3.2 (+/- 0.125)	-
Width Tolerance	mm (in)	+/- 1.6 (+/- 0.63)	-
Water Vapour Transmission	ng	>87	ASTM E96
Density	Kg/m^3 (lbs/ft^3)	23 (1.4)	ASTM 1622-03
Compressive Strength (Type 2)	kPa (psi)	136 (19.7)	ASTM D1621-04a
Long Term Thermal Resistance	Thermal Resistance Remains Stable Over Life of Service		
Flexural Strength (Type 2)	KPa (psi)	257 (37.3)	ASTM C203-05
Limiting Oxygen Index	%	26	ASTM D2863-97
Flame Spread Index	-	250	CAN/ULC-S102.2
Smoke Density Index	-	410	CAN/ULC-S102.2
Nominal RSI (R-value)	-	4.18	ASTM C518

.4 Performance Criteria:

.1 In accordance with CAN/ULC S701.

2.3 ACCESSORIES

.1 Tape: Sheathing tape for polyethylene (PE) vapour barriers tested to ASTM E96 and ASTM D3816 water penetration rate.

.1 Acceptable Manufacturers;

.1 Technical Tape Limited; Tuck Tape 202.

.2 Berry Plastic Corporation; Flex Fit.

.2 Adhesive: Premium one component, polyurethane, moisture curing adhesive. Compatible with insulation and substrate. In accordance with Section 07 92 00 – Joint Sealants.

.1 Acceptable Manufacturer;

.1 Lepage; PL-3000.

.3 Spray Foam: CAN/ULC-S705.1 Portable, self-contained two component open cell, low density 0.75 lb/ft3 polyurethane foam insulation.

.4 Fasteners: #8 to #14 Teks Wood to Metal Screws and to suit application.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 71 00: Examination and Preparations. Verify existing conditions before starting work.

.2 Verify insulation boards are unbroken, free of damage, with face membrane intact.

.3 Verify surfaces within roofing substrate being insulated have been inspected.

.4 Verify substrate surface is flat, free of honeycomb, fins, irregularities, materials or substances that may impede installation.

3.2 PREPARATION

.1 Clean surface of substances that are harmful to insulation includes removing projections capable of puncturing insulation or vapour retarders, or that interfere with insulation attachment.

3.3 INSTALLATION – MATRIX ROOFING INSULATION ASSEMBLY

.1 Install in accordance with Manufacturer's written instructions.

.2 Where applicable, the thickest layer to be installed as the bottom layer.

.3 Insulation board to be installed perpendicular to each other.

.4 Panel edges to fit snuggle together. Cut perimeter panels to fit snuggly against metal "C" channels.

.5 Apply foam in board groove. Push tongue of next board securely into groove of fastened board. Use spray foams and/or adhesives compatible with polystyrene foam insulation. For cold weather applications, use cold weather spray foams and adhesives.

.6 Tape all seams on the bottom layer of panel. Taping of top layer of panel not required.

.7 Use a spatula to apply uniform pressure to ensure a seal between tape and insulation board.

.8 Fastener spacing is 400mm(16 inch) on centre.

.9 Battens require fastener approximately 25 mm(1") at all batten ends.

.10 Top layer panel joints/connections to be staggered. Seams from top layer panels must not align directly over seams of bottom layer panels.

.11 Top layer batten ends to be fastened to lower layer battens. Top layer fasteners must fasten through top layer battens to bottom layer battens. Do not remove misplaced fasteners. Install another fastener in close proximity to the misplaced fastener.

.12 Apply a liberal continuous bead of sealant at the end of all top panel edges. Air channels are to be completely sealed. As well, seal any other top edge transitions.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning.

.1 Leave Work area clean at end of each day.

.2 Waste Management:

.1 Coordinate recycling of waste materials with 01 74 19 – Construction Waste Management and Disposal.

.2 Collect recyclable waste and dispose of or recycle field generated construction waster created during construction or final cleaning related to work of this section.

.3 Remove recycling and waste containers from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Protect installed panels until completion of project.

.2 Touch-up, repair or replace damaged products.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Foamed-in-place insulation.

.1 In exterior wall crevices.

.2 At junctions of dissimilar wall and roof materials.

1.2 RELATED REQUIREMENTS

.1 Section 07 25 00 - Weather Barriers: Polyurethane air sealant foam

1.3 REFERENCE STANDARDS

.1 ASTM D6226 - Standard Test Method for Open Cell Content of Rigid Cellular Plastics 2015.

.2 ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

.3 ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members 2017.

.4 ASTM E759/E759M - Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members 1992, with Editorial Revision (2015).

.5 ASTM E761/E761M - Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members 1992, with Editorial Revision (2015).

.6 ASTM E859/E859M - Standard Test Method for Air Erosion of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members 1993, with Editorial Revision (2015).

.7 ASTM E2178 - Standard Test Method for Air Permeance of Building Materials 2013.

.8 CAN/ULC S101 - Standard Methods of Fire Endurance Tests of Building Construction and Materials 2014.

.9 CAN/ULC S124 - Standard Method of Test for the Evaluation of Thermal Barriers for Foamed Plastic 2018.

.10 CAN/ULC S705.1 - Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material Specification 2015.

.11 CAN/ULC S741 - Standard for Air Barrier Materials - Specification 2008 (R2016).

.12 CAN/ULC S770 - Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams 2015.

.13 ULC (DIR) - Online Certifications Directory (Canada) Current Edition.

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide product description, insulation properties, and preparation requirements.

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.3 Manufacturer's certificates: Certify that products of this section meet or exceed specified requirements.

.4 Manufacturer's installation instructions: Indicate special procedures, information on special environmental conditions required for installation and perimeter conditions requiring special attention.

.5 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.

1.6 SITE CONDITIONS

.1 Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

.2 Do not apply foam when temperature is within 3 degrees C of dew point.

Part 2 Products

2.1 MATERIALS

.1 Sprayed polyurethane foam insulation (SPFI): Two component, polyurethane resin and polyol, closed cell foamed-in-place insulation containing recycled materials in accordance with CAN/ULC S705.1 and having the following minimum properties:

.1 Water vapour permeance: 60 ng/(Pa s sqm), qualifying as a vapour retarder in applied thicknesses of 50 mm and greater; water vapour permeance tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.

.2 Air leakage rate: Maximum 0.02 L/sec·sq m at 75 Pa when tested in accordance with CAN/ULC S741 or ASTM E2178.

.3 Long term thermal resistance: Nominal RSI-value 0.9/25 mm in accordance with CAN/ULC S770.

.4 Density: Nominal 35 kg/cu m plus or minus 10 percent.

.5 Closed cell content: Minimum 95 percent in accordance with ASTM D6226.

.6 Ozone depletion Potential: Zero.

.7 Global warming potential: Low.

.2 Thermal barrier for foamed-in-place insulation (flame spread protection): Spray applied, cement based fire resistant material, wet mix spray applied fireproofing meeting requirements of CAN/ULC S101, CAN/ULC S124, ASTM E736/E736M, ASTM, E759/E759M, ASTM E761/E761M and ASTM E859/E859M; containing no asbestos fibre, ULC (DIR) labelled and listed for assemblies and fire ratings indicated on Drawings, and as follows:

.1 Water: Potable.

.2 Damming materials: In accordance with the tested assembly being installed as

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acceptable to Authorities Having Jurisdiction, and as recommended by manufacturer.

.3 Firestopping mortar: Cementitious, single component fire resistive mortar coating; charcoal colour; tested, listed, and certified by ULC.

2.2 ACCESSORIES

.1 Primer: As required by insulation manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Verify work within construction spaces or crevices is complete prior to insulation application.

.2 Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2 PREPARATION

.1 Mask and protect adjacent surfaces from over spray or dusting.

.2 Apply primer in accordance with manufacturer's instructions.

3.3 APPLICATION

.1 Apply insulation in accordance with manufacturer's instructions.

.2 Apply insulation by spray method, to a uniform monolithic density without voids.

.3 Apply to a minimum cured thickness indicated.

.4 Apply thermal barrier monolithically, without voids to fully cover foam insulation, to achieve fire rating required.

.5 Patch damaged areas.

.6 Where applied to voids and gaps ensure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

3.4 PROTECTION

.1 Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Air/vapour barrier (A/VB) membrane: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapour resistant and airtight.

.2 Air barriers: Vapour-permeable materials that form a system to stop passage of air through exterior walls.

1.2 RELATED REQUIREMENTS

.1 Section 07 52 00 - Modified Bituminous Membrane Roofing.

1.3 DEFINITIONS

.1 Weather barrier: Assemblies that form either air barriers, or air/vapour barriers.

.2 Air barrier: Airtight barrier made of material that is relatively air impermeable but water vapour permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapour impermeable air barriers are classified as air/vapour barriers.

.3 Air/vapour barrier (A/VB): Airtight barrier made of material that is relatively water vapour impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

.1 Water Vapour Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) 1 perm.

1.4 REFERENCE STANDARDS

.1 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

.2 ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2017.

.3 ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

.4 ASTM E2178 - Standard Test Method for Air Permeance of Building Materials 2013.

.5 ULC S710.1 - Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification 2011.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meeting: Schedule pre-installation meeting with Contractor, installer, manufacturer, Owner, Consultant, and necessary parties to review and discuss project conditions. Conduct pre-installation meeting minimum one week before starting weather barrier work and on-site installations to:

.1 Verify project requirements.

.2 Verify substrate conditions.

.3 Co-ordinate products, installation methods and techniques.

.4 Sequence work of related sections, including but not limited to structural-support framing, curtain wall system, and roofing.

.5 Co-ordinate with other building subtrades.

1.5 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide data on material characteristics.

.3 Installer's qualification statement.

.4 Statement of compatibility: Provide letter(s), provided and signed by manufacturer of weather barrier membrane material(s), that products used on the project are compatible with adjacent materials, and materials with which the air barrier membrane will be in contact or sealed.

1.6 QUALITY ASSURANCE

.1 Qualifications: Provide proof of qualifications when requested by Consultant:

.1 Installer: Use an installation company that is acceptable to the manufacturer, using workers who are trained and approved by the weather barrier manufacturer having experience with projects of similar complexity and area.

.2 Manufacturer’s services: As part of weather barrier membrane manufacturer's services specified in Article SITE QUALITY CONTROL, schedule site visit to review Work, at stages listed.

.1 After delivery and storage of products, when preparatory Work is complete at beginning of installation.

1.7 MOCK-UPS

.1 Install air barrier and air/vapour barrier materials in mock-up specified in Section 04 43 13.

1.8 SITE CONDITIONS

.1 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

Part 2 Products

2.1 WEATHER BARRIER ASSEMBLIES

.1 Air barrier:

.1 On outside surface of insulation of exterior walls use air barrier sheet, mechanically fastened type.

.2 Exterior air/vapour barrier:

.1 On outside surface of sheathing use air/vapour barrier sheet, self-adhesive type.

2.2 AIR BARRIER MATERIALS (WATER VAPOUR PERMEABLE AND WATER- RESISTIVE)

.1 Air barrier sheet, mechanically fastened:

.1 Air permeance: 0.02 L/s/sq m, maximum, when tested in accordance with ASTM E2178.

.2 Water vapour permeance: 286 ng/(Pa s sq m), minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).

.3 Ultraviolet (UV) and weathering Resistance: Approved in writing by manufacturer for minimum 120 days of weather exposure.

.4 Seam and perimeter tape: Polyethylene self adhering type, mesh reinforced, 50 mm wide, compatible with sheet material, or integrated tape.

.5 Colour: Black, for open joint cladding.

.6 Manufacturers:

.1 VaproShield, LLC; RevealShield IT Integrated Tape.

.2 Dorken; Delta-Vent S Plus.

.3 SRP; AirOutshield UV.

2.3 AIR/VAPOUR BARRIER MATERIALS

.1 Air/vapour barrier membrane:

.1 Type: Rubberized asphalt bonded to thermoplastic sheet, self-adhesive.

.2 Thickness: 1.0 mm, nominal.

.3 Sheet width: Manufacturer's standard.

.4 Air permeance: 0.02 L/s/sq m, maximum, when tested in accordance with ASTM E2178.

.5 Water vapour performance: 2.87 ng/(Pa s sq m), maximum, when tested in accordance with ASTM E96/E96M.

.6 Low temperature flexibility: Less than -20 degrees Celsius.

.7 Water penetration resistance around nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).

.8 Seam and perimeter tape: As recommended by sheet manufacturer.

.9 Manufacturers:

.1 Henry; Blueskin SA LT.

.2 IKO Commercial; AquaBarrier AVB LT.

.3 Soprema; SopraSeal Stick 1100 T WG.

.4 W.R. Meadows; AirSheild Low Temp.

.5 GCP Applied Technologies; Perm-A-Barrier NPS

2.4 ACCESSORIES

.1 Sealants, tapes, and accessories for sealing weather barrier and sealing weather barrier to adjacent substrates: As specified or as recommended by weather

barrier manufacturer.

.2 Polyurethane air sealant foam (referred to on the Drawings as "spray foam sealant"): One-component, low-expansion, 15 kg per cu. metre density, complying with ULC S710.1.

.3 Flexible flashing: Self-adhering SBS modified bitumen integrally laminated to cross laminated polyethylene film, minimum 1.0 mm thick, compatible with air/vapour barrier membrane.

.4 Liquid flashing: One-part, fast curing, non-sag, elastomeric, gun grade, trowelable liquid flashing.

.5 Steel transition strips: Zinc coated, cold rolled steel sheet, 275 designation coating to ASTM A653/A653M, configuration indicated.

.6 Primers: As recommended by material manufacturer.

.7 Cleaners: As recommended by material manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

3.2 PREPARATION

.1 Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

.2 Clean and prime substrate surfaces to receive self-adhered membranes in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install materials in accordance with manufacturer's instructions.

.2 Air barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

.3 Air/vapour barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

.4 Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

.5 Mechanically fastened air barrier - On outside face of insulation behind metal cladding:

.1 Install sheets over mineral fibre insulation in shingle-fashion to shed water, with seams generally horizontal.

.2 Overlap seams as recommended by manufacturer but at least 150 mm.

.3 Overlap at outside and inside corners as recommended by manufacturer but at least 300 mm.

.4 Attach to z-girts or hat-channels fastened to continuous insulation

support clips supporting metal cladding. Space fasteners at 300 to 460 mm on centre along each framing member supporting cladding.

.5 Seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.

.6 Install air barrier under jamb flashing.

.7 Install head flashing under weather barrier.

.8 At openings to be filled with frames having nailing flanges, wrap excess sheet into opening, at head, seal sheet over flange and flashing.

.6 Self-adhered air/vapour barrier membrane:

.1 Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.

.2 At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

.3 Lap sheets shingle-fashion to shed water and seal laps airtight.

.4 Minimize joints. Offset vertical joints minimum 300 mm.

.5 Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.

.6 Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.

.7 At wide joints, provide extra flexible membrane allowing joint movement.

.8 Continue membrane installation over junctions, at changes in wall construction, and other construction. Reinforce corners with additional piece of membrane cut and formed to seal corners. Caulk to ensure complete seal. Position lap seal over firm bearing.

.9 At end of each workday seal top edge of membrane to substrate with termination mastic.

.7 Openings and penetrations in exterior weather barriers:

.1 Install flashing over sills, covering entire sill frame member, extending at least 125 mm onto weather barrier and at least 150 mm up jambs; mechanically fasten stretched edges.

.2 At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 100 mm wide; do not seal sill flange.

.3 At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 230 mm wide, covering entire depth of framing.

.4 At head of openings, install flashing under weather barrier extending at least 50 mm beyond face of jambs; seal weather barrier to flashing.

.5 At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.

.6 Service and other penetrations: Form flashing around penetrating item and seal to weather barrier surface.

.7 Fill gaps and voids between heads, jambs, and sills and their rough openings, and where indicated on the Drawings with backer rod and sealant, or polyurethane air sealant foam as indicated on Drawings.

.8 Inspect installation prior to enclosing. Repair punctures, damaged areas and inadequately lapped seams with a patch of membrane sized to extend 150 mm in all directions from perimeter of affected area.

3.4 INSTALLATION - STEEL TRANSITION STRIP

.1 Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with sheet-steel transition strip mechanically fastened to structural framing to provide continuous support for membrane materials.

.2 Roof/wall transition: Fasten sheet steel transition strip, bent to shape required, to roof and curtain wall or wall substrates. Length of legs indicated. Form transition strip to allow for deflection. Stagger joints in L-shape transition strip with joints in wall air/vapour barrier.

.3 Butt joints:

.1 Clean and prime steel substrate to receive membrane materials in accordance with membrane manufacturer's instructions.

.2 Apply 150 mm wide strip of self-adhesive membrane along joints. Roll firmly in place.

.4 Apply 150 by 150 mm patch of self-adhesive membrane centred over fasteners.

3.5 SITE QUALITY CONTROL

.1 See Section 01 45 00 - Quality Control, for additional requirements.

.2 Allow access for inspection and testing of installed air and vapour membranes, and repair of deficiencies before placement of insulation materials.

.3 Do not cover installed weather barriers until required inspections have been completed.

.4 Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

.5 Take digital photographs of each portion of the installation prior to covering up.

.6 Manufacturer's field services:

.1 Obtain written report from weather barrier membrane manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as specified in article SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and site visit for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visit to review Work, as specified in article QUALITY ASSURANCE.

3.6 PROTECTION

.1 Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Below-grade vapour barrier.

1.2 RELATED REQUIREMENTS

.1 Section 31 23 33 - Excavating Trenching and Backfilling

1.3 REFERENCE STANDARDS

.1 ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2011 (Reapproved 2017).

.2 ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide data on material characteristics.

Part 2 Products

2.1 MATERIALS

.1 Vapour barrier: To ASTM E1745, Class A, 0.381 mm thick.

2.2 ACCESSORIES

.1 Joint sealing tape: Air resistant pressure sensitive adhesive tape, type recommended by vapour retarder manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

.2 Pointing mastic: Pre-mixed cold-applied single-component polymeric flexible sealing compound, designed for use with vapour retarder.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Verify sub-grade is properly prepared and at correct elevation, level, smooth without sharp projections that could puncture vapour retarder.

.3 Report unsatisfactory conditions to the Consultant in writing.

3.2 PREPARATION

.1 Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.1 INSTALLATION

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.1 Install materials in accordance with manufacturer's instructions and ASTM E1643.

.2 Use sheets of largest practical size to minimize joints. Lap joints 150 mm and tape continuously.

.3 Seal vapour retarder to foundations using pointing mastic, and mechanically fasten to inside face of grade beams and foundation walls as indicated.

.4 Seal penetrations, including pipe penetrations, with fabricated collar.

.5 Inspect for continuity and repair as follows:

.1 Repair small punctures and tears with sealing tape before work is concealed.

.2 Where damage to vapour retarder exceeds tape width, repair with additional layer of vapour retarder, minimum 150 mm overlap in all directions from edge of damage.

.1 Tape continuously around perimeter of patch.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Manufactured metal panels for exterior wall panels, subgirt framing assembly, with insulation, related flashings, and accessory components.

1.2 RELATED REQUIREMENTS

.1 Section 07 21 00 – Thermal Insulation: Insulation.

.2 Section 07 25 00 – Weather Barriers: Weather barrier under wall panels.

.3 Section 07 92 00 – Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.3 REFERENCE STANDARDS

.1 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data - Wall System: Manufacturer's data sheets on each product to be used, including:

.1 Physical characteristics of components shown on Shop Drawings.

.2 Storage and handling requirements and recommendations.

.3 Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, supplementary framing including girts and hat channels, and methods of anchorage.

.1 Design data: Shop Drawings signed and sealed by a professional structural engineer.

.4 Samples: Submit two samples of each type of wall panel, 305 mm by 305 mm in size illustrating finish colour, sheen, and texture.

.5 Designer's qualification statement.

.6 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Designer qualifications: Design cladding support system for wall assemblies under direct supervision of a Professional Engineer experienced in design of this work and licensed in the Province of Manitoba.

.2 Installer qualifications: Company specializing in installing products of the type specified in this section with minimum three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Protect panels from accelerated weathering by removing or venting sheet plastic

shipping wrap.

.2 Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

.3 Prevent contact with materials that may cause discolouration or staining of products.

1.7 WARRANTY

.1 See Section 01 78 00 – Closeout Submittals for additional warranty requirements.

.2 Correct defective work within a 20 year period after Date of Substantial Performance for degradation of panel finish, including colour fading caused by exposure to weather.

.3 Correct defective work within a five year period after Date of Substantial Performance, including defects in water tightness and integrity of seals.

Part 2 Products

2.1 MANUFACTURED METAL PANELS

.1 Wall panel system: Factory fabricated prefinished metal panel system, site assembled.

.1 Provide exterior wall panels, interior liner panels, and subgirt framing assembly.

.2 Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.

.3 Design pressure: In accordance with applicable codes.

.4 Maximum allowable deflection of panel: L/180 for length(L) of span.

.5 Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.

.6 Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

.7 Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.

.2 Exterior wall panels:

.1 Refer to Architectural Drawings for panel profiles and colours.

.2 Side seams: Lapped, sealed with continuous bead of sealant.

.3 Material: Precoated steel sheet, 22 gauge.

.4 Fastening: Exposed. Colour to match panel.

.5 Acceptable Manufacturers:

.1 Agway

.2 Westman Steel

.3 Substitutions: See 01 25 13 – Product Substitution Procedures.

.3 Vented Soffit:

.1 Refer to Architectural Drawings for locations

.2 Perforated, pre painted steel. 28 gauge

.3 Continuously vented on top face 1.8” diameter holes

.4 Free air area of 6%

.5 Colours: Allow for 2 colours

.6 Basis of Design:

.1 Agway Metals Canada: Vented Soffit CH5-32

.4 Internal and external corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

.5 Expansion joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.

.6 Trim, closure pieces, caps, flashings, and kick base: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

.7 Anchors: Galvanized steel.

2.2 MATERIALS

.1 Precoated steel sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

.2 Select materials with surface flatness, smoothness, and lack of surface blemishes where exposed to view in finished system.

.3 Insulation: Semi-rigid mineral fibre type specified in Section 07 21 00.

2.3 FINISHES

.1 Exposed surface finish - Exterior metal cladding: Panel manufacturer's 4-coat polyvinylidene fluoride (PVDF) coating with metallic flakes, topcoat over epoxy primer.

.2 Panel backside finish: Panel manufacturer's standard siliconized polyester wash coat.

.3 Interior application, panel finish: Panel manufacturer's standard siliconized polyester coating, topcoat over recommended primer.

2.4 ACCESSORIES

.1 Cladding support clips: Specified in Section 07 05 43.

.2 Concealed sealants: Non-curing butyl sealant or tape sealant.

.3 Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Exposed fasteners same finish as panel system.

.1 Metal-to-metal fasteners: Self-drilling, self-tapping screws.

.4 Site touch-up paint: As recommended by panel manufacturer.

.5 Bituminous paint: Asphalt base.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that building framing members are ready to receive panels.

.2 Verify that air/vapour barrier has been installed over substrate completely and correctly; see Section 07 25 00.

3.2 PREPARATION

.1 Install cladding support clips in accordance with manufacturer's instructions, and reviewed Shop Drawings.

.2 Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane. Space at intervals indicated.

3.3 INSTALLATION

.1 Install panels on walls in accordance with manufacturer's instructions.

.2 Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.

.3 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall panels to building structure.

.4 Fasten panels to structural supports; aligned, level, and plumb. Align exposed fasteners.

.5 Locate joints over supports.

.6 Lap panel ends minimum 51 mm.

.7 Provide expansion joints where indicated.

.8 Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.4 TOLERANCES

.1 Maximum offset from true alignment between adjacent members butting or in line: 1.6 mm.

.2 Maximum variation from plane or location indicated on drawings: 6.4 mm.

3.5 CLEANING

.1 Remove site cuttings from finish surfaces.

.2 Remove protective material from wall panel surfaces.

.3 Clean and wash prefinished surfaces with mild soap and water. Rinse with clean water.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Snap Lock sheet metal roofing.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: roof curbs, nailers, blocking, backing for roofing work.

.2 Section 07 42 13 – Metal Wall Panels.

.3 Section 07 21 13 – Board Insulation: board insulation for sheet metal roofing.

.4 Section 07 27 13 – Air Barriers: Modified Bituminous Sheet: exterior wall air barrier membranes.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM C1177/C1177M, Specification for Glass Mat Gypsum Substrate for Use as a Sheathing.

.2 Canadian Standards Association (CSA)

.1 CSA O121 - Douglas Fir Plywood.

.2 CSA O151 - Canadian Softwood Plywood.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 Manufacturers' Standard Gauge (MSG).

.2 CSSBI Steel Sheet Facts No. 10 - Steel Gauges and Thicknesses.

.5 National Building Code of Canada (NBCC)

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings:

.1 Indicate sizes and dimensions, components, materials and finishes, metal gauges and thickness, fastening details, compliance with design criteria and requirements of related work.

.2 Indicate arrangement of roof panels including joints, types and location of supports, fasteners and special shapes.

.3 Include details of seams, supports, and other system components.

.3 Samples:

.1 Submit two complete sets of colour samples of coil coatings in manufacturer's full colour range for colour selection by Consultant.

.2 Submit samples of thermal spacers, sub-framing, and fasteners.

1.5 QUALITY ASSURANCE

.1 Performance Requirements: provide components that have been manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

.2 Qualifications fabricator/installer: approved by manufacturer and experienced in performing work of similar type and scope. When requested, provide a list of the last 3 comparable jobs, including job name & location, specifying authority and project manager.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements and manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect sheet metal from nicks, scratches, and blemishes.

.3 During storage stack panels tilted to provide water runoff. Cover materials to protect from weathering.

.4 Replace defective or damaged materials with new.

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: to ASTM A653/A653M, commercial quality, with Z275 designation coating, regular spangle surface, prefinished as specified. Base metal thickness specified by item.

2.2 PREFINISHED STEEL SHEET

.1 Zinc coated steel sheet with factory applied silicone modified polyester (SMP) coil coating. 24 gauge.

.1 Basis of Design: Agway Metals Snap Lock SL38

.1 Finish: Wrinkle Coat Series SMP

.2 Colour: Ebony QC09822

2.3 DECK COVERING

.1 Glass Mat, Gypsum Board: to ASTM C 1179, water resistant treated core, glass matt facing, thickness indicated.

.1 Exterior sheathing board: refer to Section 09 21 16 and assemblies on Architectural drawings for type and thicknesses.

.2 Plywood sheathing: Douglas fir plywood to CSA 0121 or Canadian softwood plywood to CSA 0151, standard construction, thickness indicated, pressure preservative treated in accordance with Section 06 10 00 – Rough Carpentry.

2.4 AIR BARRIER MEMBRANE

.1 Roofing air barrier membrane:

.1 Self-adhesive SBS modified bitumen sheet, selvage edge, top surface slip-resistant polyethylene film; bottom surface silicone release paper.

.2 Thickness: 1 mm (0.040 mils) minimum.

.3 Water vapour transmission: 0.88 ng/m²·s (0.015 perms) tested to ASTM E96.

.4 Air leakage: 0.01 l/m²·s at 75 Pa pressure difference to ASTM E283 test.

.5 Acceptable material: Henry/Bakor RF200; IKO Goldshield Premium; Grace Ice & Water Shield; Soprema Lastobond Shield.

.2 Vapour permeable air barrier: to CAN/CGSB-51.32, spunbonded olefin type. Complete with joint seaming tape.

.1 Acceptable material: Tyvek CommercialWrap; Styrofoam Weathermate Plus.

.3 Primers: type recommended by manufacturer, suitable for substrate and site conditions.

.4 Mastics and sealants: type recommended by manufacturer, suitable for substrate and site conditions.

.5 Flashing and stripping membranes: type recommended by air barrier membrane manufacturer, suitable for substrate and site conditions.

.6 Provide all materials from same manufacturer.

2.5 ROOFING INSULATION

.1 Board insulation as specified in Section 07 21 17 – Board Insulation, of thickness indicated on Architectural Drawings.

2.6 ACCESSORIES

.1 Snow/ice Guards: design and fabricate snow/ice guards to prevent snow and ice from sliding off the roof. Design guards such that a portion of the guard extends down between the ribs of the roof panels to prevent ice columns from sliding underneath the guards. Guards shall have same finish and colour as roof panels.

.1 Acceptable Product: S-5 ColorGard 2.0 with accessories:

.1 SnowClip2.0 coordinated with depth of roof panel.

.2 ColorStrip coordinated with metal roof supplier

.2 Fasteners:

.1 Roof system components: as recommended by roof system manufacturer, head colour to match materials being fastened, corrosion resistant.

.2 Deck covering to steel deck: No. 10 flat head, self-tapping, Type A or AB, corrosion resistant zinc plated screws. Recommend FM Approved screw and plate assemblies.

.3 Use corrosion resistant fasteners for securing pressure preservative treated plywood sheathing.

.3 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.4 Sealants: as specified in Section 07 92 00 - Joint Sealing.

.5 Touch-up paint: as recommended by sheet metal roofing manufacture.

.6 Isolation coating: alkali resistant bituminous paint.

2.7 DESIGN CRITERIA

.1 Base steel thicknesses of sheet steel:

.1 Base metal thicknesses for sheet steel specified in this section are based on Manufacturers Standard Gauge (MSG) system. The minimum thickness shall be the design thickness (nominal base steel thickness) minus the maximum allowable under-tolerance as specified by CSA-S136. Thicknesses (gauge) specified are for uncoated steel.

.2 Design thicknesses are in accordance with CSSBI Sheet Steel Facts No. 10, Table 1 - MSG Sheet Steel Gauge Numbers and Thicknesses

.2 Design sheet metal roofing to provide for thermal movement of component materials caused by ambient temperature range of -35°C to 75°C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.3 Include expansion joints to accommodate movement in roofing system and between roofing system and building structure, caused by structural movements, without permanent distortion, damage to infill, racking of joints, breakage of seals, or water penetration.

.4 Design members to withstand dead load, snow loads and build-up and wind loads including uplift, calculated in accordance with NBCC and applicable local regulations.

.5 Deflection of roof system under live loads shall not exceed 1/180th of span.

.6 Provide for positive drainage of condensation occurring behind roof panels and water entering at joints, to exterior face of panels.

.7 Flashing to match colour of roof.

2.8 FABRICATION

.1 Form individual pieces in maximum lengths to reduce number of joints. Make allowances for expansion at joints.

.2 Hem exposed edges on underside 12 mm, miter and seal.

.3 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.4 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.5 Protect metals against oxidization by back painting with isolation coating.

.6 All cut edges to be treated with touch up paint as required by Manufacturer, and all metal edges to be made smooth.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for sheet metal roofing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 DECK COVERING

.1 Mechanically fasten deck covering to steel deck with screws spaced 400 mm on centre each way.

.2 Place with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

3.3 AIR BARRIER INSTALLATION

.1 Install air barrier membrane in accordance with Section 07 25 00 – Weather Barriers: Modified Bituminous Sheet and manufacturer’s instructions.

3.4 INSULATION INSTALLATION

.1 Install roofing insulation in accordance with Section 07 21 00 – Thermal Insulation.

3.5 INSTALLATION: THERMAL SPACERS AND SUB-FRAMING

.1 Sub-framing: Ensure thermal spacer type is selected to accommodate orientation of vertical and horizontal sub-framing.

.2 Sub-framing Thermal Spacer Installation: Install thermal spacers in accordance with spacer manufacturer’s written recommendations. Use recommended fasteners only.

.3 Thermal Spacer Installation: Clip thermal spacer to Z-girt and fasten girt directly to substrate spaced at centres to suit design requirements.

.4 Installation sequence for spacers, sub-framing, and insulation - Option 1:

.1 Pre-punch holes or pre-drill holes in Z-girts and tracks to accommodate fasteners.

.2 Position Z-girts directly over thermal spacer before installation of fasteners.

.3 Completely install thermal spacers and screws for first Z-girt / track. For subsequent girts:

.1 Fasten top spacer with single screw through Z-girt and spacer into substrate ensuring spacer can pivot for accurate alignment.

.2 Friction fit insulation in place before completing installation of remaining screws to secure Z-girt and thermal spacers.

.1 Ensure insulation is tightly fitted with sides of insulation slightly compressed at each insulation spacer.

.2 Ensure insulation pieces are in contact with no linear gaps between spacers.

.5 Installation sequence for spacers, sub-framing, and insulation - Option 2:

.1 Completely install spacers, screws and sub-framing, prior to installing insulation.

.2 Friction fit insulation in place as follows:

.1 For semi-rigid insulation batts or boards, notch the batts at the location of the clip to match the top and bottom of the Clip.

.2 Push insulation into place, compressing it at the Clip location, and ensuring no linear gaps in the adjacent insulation boards on either side of the Clip

.3 Flatten board against substrate if necessary, with corrosion resistant stick pins or other mechanical insulation retention devices 400 mm maximum on centre along centreline of insulation batts or boards and in accordance with insulation manufacturer's written recommendations.

3.6 INSTALLATION: SHEET METAL ROOFING

.1 Use concealed fastenings except where approved by Consultant before installation.

.2 Apply sheathing paper between insulation and roof panels. Secure in place and lap joints minimum 100 mm. Lap sheets in direction of water flow.

.3 Isolate sheet metal work from direct contact with cementitious materials, dissimilar metals, and pressure-preservative treated wood.

.4 Install sheet metal roof panels using panel support clips spaced at maximum 600 mm on centre, with two fasteners each.

.5 Align transverse seams in adjacent panels.

.6 Flash roof penetrations with material matching roof panels and make watertight.

.7 Form seams in direction of water-flow and make watertight.

3.7 STANDING SEAM ROOFING

.1 Use prefinished steel sheet; minimum base metal thickness 22 MSG, Use sheets wide enough to make 50 mm high standing seams at 300 mm on centre without straight run of standing seam exceeding 13500 mm.

.2 Form roof panels without optional stiffening flutes.

.3 Fold lower end of each pan under 20 mm.

.1 Slit fold 25 mm away from corner to form tab where pan turns up to make standing seam.

.2 Fold upper end of each pan over 50 mm.

.3 Hook 20 mm fold on lower end of upper pan into 50 mm fold on upper end of underlying pan.

.4 Seal seams with a mechanical or hand seamer.

.5 Provide side lap caulking for roof panels.

.6 Apply sheet metal roofing beginning at eaves. Loose lock pans to edge strips at eaves and gable rakes.

.7 Finish standing seams 50 mm high on all surfaces.

.1 Make first fold 6 mm wide single fold and second fold 12 mm wide, providing locked portion of standing seam with 5 plies in thickness for 180° seam (I-style).

.2 Fold lower ends of seams at eaves over at 45° angle.

3.8 TOLERANCES

.1 Maintain following construction tolerances:

.1 Maximum variation from plane or location shown on shop drawings: 10 mm/10 m of length and up to 20 mm/100 m.

.2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.

3.9 CLEANING

.1 Progress cleaning: clean in accordance with Section 01 74 11 – Cleaning. Leave work are clean at end of each day.

.2 Final cleaning:

.1 Upon completion remover surplus material, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

.2 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Remove dirt, dust, hand prints and other blemishes. Wipe surfaces clean as part of final clean up.

.3 Remove excess sealant with recommended solvent.

3.10 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by sheet metal roofing installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Fabricated sheet metal items, including flashings, counterflashings, and other items indicated in Schedule.

.2 Sealants for joints within sheet metal fabrications.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry: Wood nailers for sheet metal work.

.2 Section 07 92 00 – Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.3 REFERENCE STANDARDS

.1 AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020.

.2 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

.3 ASTM C920 – Standard Specification for Elastomeric Joint Sealants 2018.

.4 ASTM D4586/D4586M – Standard Specification for Asphalt Roof Cement, Asbestos- Free 2007, with Editorial Revision (2012).

.5 SMACNA (ASMM) – Architectural Sheet Metal Manual 2012.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details. Distinguish between shop- and field-assembled work.

.3 Samples: Submit two samples 50 by 50 mm in size illustrating metal finish colour.

.4 Fabricator's qualification statement.

.5 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

.2 Fabricator and installer qualifications: Company specializing in sheet metal work with documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Stack material to prevent twisting, bending, and abrasion, and to provide ventilation.

Slope metal sheets to ensure drainage.

.2 Prevent contact with materials that could cause discolouration or staining.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 Metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak or loosen, and shall remain watertight, and provide finished appearance.

2.2 SHEET MATERIALS

.1 Galvanized steel: ASTM A653/A653M, with G90/275 zinc coating; minimum 0.61 mm thick base metal.

.2 Pre-finished galvanized steel: ASTM A653/A653M, with G90/275 zinc coating; minimum 0.76 mm thick base metal, shop pre-coated with PVDF coating.

.1 PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

.2 Colour: Prefinished, colour as selected by Architect.

2.3 FABRICATION

.1 General: Custom fabricate sheet metal flashing and trim to comply with SMACNA's Architectural Sheet Metal Manual that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

.2 Form sections true to shape, accurate in size, square, and free from distortion or defects.

.3 Fabricate cleats of same material as sheet, minimum 50 mm wide, interlocking with sheet.

.4 Form pieces in longest possible lengths.

.5 Hem exposed edges on underside 13 mm; miter and seam corners.

.6 Form material with hooked seams, except where otherwise indicated; at moving joints, use sealed lapped, or interlocking hooked seams.

.7 Form flashing and trim to conceal fasteners and expansion provisions where possible. Exposed fasteners are not permitted on faces exposed to view.

.8 Fabricate corners from one piece with minimum 450 mm long legs; seam for rigidity, seal with sealant.

.9 Fabricate vertical faces with bottom edge formed outward 12 mm and hemmed to form drip.

.10 Fabricate roof edge flashings to extend over face of parapet as indicated.

.11 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 ACCESSORIES

.1 Fasteners:

.1 Screws: Prefinished steel with fibreglass reinforced nylon head and soft neoprene washer, at exposed locations. Finish exposed fasteners to be same colour as flashing and fascias.

.2 Nails: Of same material as sheet metal to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing applications.

.3 Washers: Of same materials as sheet metal, 1mm (0.04”) thick, with rubber packing.

.2 Primer: Zinc chromate type.

.3 Protective backing paint: Zinc molybdate alkyd.

.4 Concealed sealants: Non-curing butyl sealant.

.5 Exposed sealants: ASTM C920; elastomeric sealant, with minimum movement capability as colour to match adjacent material recommended by manufacturer for substrates to be sealed; colour to match adjacent material.

.6 Plastic cement: to CGSB 37-GP-Ma.

.7 Roofing cement: ASTM D4586/D4586M, Type I.

Part 3 Execution

3.1 EXAMINATION

.1 Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

.2 Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

.1 Install starter and edge strips, and cleats before starting installation.

.2 Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 0.4 mm.

3.3 INSTALLATION

.1 Install sheet metal work in accordance with SMACNA Architectural Sheet Metal Manual, and as indicated.

.2 Install sheet metal flashing and trim to fit substrates and to result in watertight performance.

.3 Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

.4 Apply plastic cement compound between metal flashings and felt flashings.

.5 Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

.6 Seal metal joints watertight.

.7 Roof edge flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA Architectural Sheet Metal Manual, and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 76 mm centres.

3.4 SCHEDULE

.1 Masonry drip edge:

.1 Material: Prefinished galvanized steel.

.2 Thickness: 1.02 mm base metal thickness.

.2 Coping, cap, parapet, sill and ledge flashings:

.1 Material: Prefinished galvanized steel.

.2 Thickness: 1.02 mm base metal thickness within 1,200 mm of finished floor or grade; 0.76 mm base metal thickness elsewhere.

.3 Sheet metal roof expansion joint covers, and roof-to-wall joint covers:

.1 Material: Prefinished galvanized steel.

.2 Thickness: 0.76 mm base metal thickness.

.4 Counterflashings at roofing terminations (over roofing base flashings):

.1 Material: Galvanized steel.

.2 Thickness: 0.61 mm base metal thickness.

.5 Counterflashings at curb-mounted roof items:

.1 Material: Galvanized steel.

.2 Thickness: 0.61 mm base metal thickness.

.6 Eavestroughs and downspouts:

.1 Material: Prepainted steel

.2 Thickness: 0.76 mm

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Work Included: Provide factory-fabricated roof hatches for ladder access.

1.2 SUBMITTALS

.1 Product Data: Submit manufacturer's product data.

.2 Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.

.3 Warranty: Submit executed copy of manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

.1 Manufacturer: A minimum of 5 years experience manufacturing similar products.

.2 Installer: A minimum of 2 years experience installing similar products.

.3 Manufacturer's Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.5 WARRANTY

.1 Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 - PRODUCTS

2.1 MANUFACTURER

.1 Basis-of-Design Manufacturer:
The BILCO Company
P.O. Box 1203, New Haven, CT 06505,
1-800-366-6530
Website: www.BILCO.com

2.2 ROOF HATCH

.1 Model: BILCO Type E-50TB Thermally broken single leaf complete with guard rails.

1. Furnish and install where indicated on plans metal roof hatch, size width: 36" (914mm) x length: 36" (914mm). The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.

.2 Substitutions: Refer to Section 01 25 13 – Product Substitution Procedures

.3 Performance characteristics:

1. Cover and curb shall be thermally broken to prevent heat transfer between interior and exterior surfaces.
2. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m^2) with a maximum deflection of 1/150th of the span or 20 psf (97kg/m^2) wind uplift.
3. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
4. Operation of the cover shall not be affected by temperature.
5. Entire hatch shall be weather tight with fully welded corner joints on cover and curb.

.4 Cover: Shall be 11 gauge (2.3mm) aluminum with a 5” (127mm) beaded flange with formed reinforcing members. Interior and exterior surfaces shall be thermally broken to minimize heat transfer and to resist condensation. Cover shall have a heavy extruded EPDM rubber gasket bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

.5 Cover insulation: Shall be 3” (75mm) thick polyisocyanurate with an R-value = 20.3 (U=0.279 W/m^2K), fully covered and protected by an 18 gauge (1mm) aluminum liner.

.6 Curb: Shall be 12” (305mm) in height and of 11 gauge (2.3mm) aluminum. Interior and exterior surfaces shall be thermally broken to minimize heat transfer and to resist condensation. The curb shall be formed with a 5-1/2” (140mm) flange with 7/16” (11mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6” (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.

.7 Curb insulation: Shall be 3” (75mm) thick polyisocyanurate with an R-value = 20.3 (U=0.279 W/m^2K).

.8 Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

.9 Hardware

1. Heavy stainless steel pintle hinges shall be provided
2. Cover shall be equipped with a spring latch with interior and exterior turn handles

3. Roof hatch shall be equipped with interior and exterior padlock hasps.
4. The latch strike shall be a stamped component bolted to the curb assembly.
5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1” (25mm) diameter red vinyl grip handle to permit easy release for closing.
6. All hardware shall be zinc plated and chromate sealed. [For installation in highly corrosive environments or when prolonged exposure to hot water or steam is anticipated, specify Type 316 stainless steel hardware].
7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

.10 Finishes: Factory finish shall be mill finish aluminum.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 Install products in strict accordance with manufacturer’s instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.

1. Test units for proper function and adjust until proper operation is achieved.
2. Repair finishes damaged during installation.
3. Restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

.1 Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated or not, and other openings indicated.

.2 Firestop devices.

.3 Fill, void, and cavity materials.

.4 Wall opening protective materials.

.5 Packing materials.

.6 Identification markings for fire and smoke rated partitions, and fire rated walls.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-in-Place Concrete: Coordination for placement of cast-in-place firestop devices.

.2 Section 04 20 00 – Unit Masonry: Coordination with installation of components that penetrate masonry assemblies, firestop components at top and perimeter of assemblies between fire compartments, and other gaps or joints within fire-resistance-rated assemblies.

.3 Section 09 21 16 – Gypsum Board Assemblies: Coordination of components that penetrate gypsum board assemblies, firestop components at top, bottom and perimeter of assemblies between fire compartments, and other gaps or joints within fire-resistance- rated assemblies.

1.3 REFERENCE STANDARDS

.1 ASTM E2307 – Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus 2015b, with Editorial Revision (2016).

.2 CAN/ULC S101 – Standard Methods of Fire Endurance Tests of Building Construction and Materials 2014.

.3 CAN/ULC S115 – Standard Method of Fire Tests of Firestop Systems 2018.

.4 CAN/ULC S702.1 – Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification 2021.

.5 FCIA – Firestop Contractors International Association Current Edition.

.6 IFC EJ Guidelines – Recommended International Firestop Council (IFC) Guidelines for Evaluating Firestop System Engineering Judgments Current Edition.

.7 NBC – National Building Code of Canada 2020.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

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.2 Firestopping schedule:

.1 List each type of penetration, each joint condition, fire rating of the assembly, and firestop system design number.

.2 Include floor plan drawings showing locations of firestopping assemblies.

.3 Include certified UL/ULC system designs, or approved substitute systems, for each condition.

.4 Include scope of proposed marking. Indicate location of effected walls, partitions, and number of markings.

.3 Product data: Provide data on product characteristics, performance ratings, limitations, and manufacturer's printed product literature for each type of marking, indicating font, foreground and background colours, wording, and overall dimensions.

.4 Samples: Submit two samples of each type of marking proposed for use, of size similar to that required for project, illustrating font, wording, and method of application.

.5 Certificate: Certify that products of this section meet or exceed specified requirements.

.6 Manufacturer's instructions: Indicate preparation and installation instructions.

.7 Installer's qualification statement.

.8 Inspection agency's qualification statement.

1.5 QUALITY ASSURANCE

.1 Fire testing: Provide firestopping System Design Listing by a testing agency to CAN/ULC S101, or determined by testing of materials meeting requirements of CAN/ULC S115, or a manufacturer's substitute system acceptable to the Authority Having Jurisdiction (AHJ).

.2 Substitute systems:

.1 If a firestop system design is not available for project-specific configuration from any manufacturer, the firestopping installer is required to obtain an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRRA) from a firestopping manufacturer.

.2 EJ and EFRRA to be prepared to IFC EJ Guidelines.

.3 Manufacturer qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

.4 Installer qualifications: Company specializing in performing the work of this section and:

.1 FCIA Contractor Member in good standing.

.2 Licensed by the Province or local authority having jurisdiction.

.3 Documented to have completed not less than 5 comparable scale projects.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer.

.2 Store and handle firestopping materials in accordance with manufacturer's instructions.

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1.7 SITE CONDITIONS

.1 Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

.2 Provide ventilation in areas where solvent-cured materials are being installed.

.3 Do not install adhered markings when ambient temperature is lower than recommended by label or sign manufacturer.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Penetrations: Provide firestop systems that resist the spread of fire and the passage of smoke and other gases according to requirements indicated including, but not limited to the following:

.1 Firestop penetrations passing through fire-resistance-rated wall and floor assemblies and other locations as indicated on Drawings.

.2 Provide and install complete penetration firestopping systems that have been tested and approved by a nationally recognized third-party testing agency.

.3 F - Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F and H ratings indicated, in accordance with CAN/ULC S115, but not less than one hour or the fire-resistance rating of the construction being penetrated.

.4 T - Rated Through-Penetration Firestop Systems: Provide firestop systems with T ratings, in addition to F ratings, in accordance with CAN/ULC S115, where indicated.

.5 L – Rated Through-Penetration Firestop Systems: Provide firestop systems with L ratings, in addition to F and T ratings, in accordance with CAN/ULC S115, where indicated.

.2 Perimeter fire containment systems: Provide interior perimeter fire containment systems with fire-resistance ratings indicated, when tested in accordance with ASTM E2307, but not less than the fire-resistance rating of the floor construction.

.3 Fire-resistive joints: Provide joint systems with fire-resistance ratings indicated, in accordance with CAN/ULC S115, but not less than the fire-resistance rating of the construction in which the joint occurs.

.4 For firestopping exposed to view, traffic, moisture, and physical damage, provide firestop system designs for these conditions with Flame Spread Rating (FSR) of less than 25 and Smoke Developed Classification (SDC) of less than 50 in accordance with CAN/ULC S102.

.5 VOC: Use materials that comply with local VOC Regulations.

2.2 FIRESTOP DEVICES

.1 Cast-in-place devices: Prefabricated flanged sleeves with intumescent liners, for use in cast-in-place concrete floors.

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.2 Curtain wall gap protection devices: Premanufactured, preformed intumescent block, purpose-made to fill building perimeter gaps between floor slabs and curtain wall facade; and as follows:

.1 Water weal: Provide water stop at bracket and butt joint locations using manufacturer's recommended sealant.

.3 Pathway devices: Pass-through sleeve for cabling, designed for re-entry.

.4 Pipe collars: Prefabricated metal collar with integral intumescent lining.

.5 Pipe sleeves: Prefabricated metal sleeve with integral intumescent lining.

2.3 FILL, VOID AND CAVITY MATERIALS

.1 Mortar: Cementitious compound, non-shrinking, for mixing with water at project site.

.2 Pillows: Reusable, intumescent, compressible pillow-shaped devices.

.3 Putty: Intumescent, non-hardening, mouldable compound.

.4 Sealant:

.1 Silicone sealant: Silicone-based, intumescent sealant.

2.4 WALL OPENING PROTECTIVE MATERIAL

.1 Outlet box firestopping: Intumescent, mouldable putty pads, precut liners or gaskets designed to protect UL listed outlet boxes.

2.5 PACKING MATERIALS

.1 Safing Insulation: Mineral wool insulation to CAN/ULC S702.1 Type 1; preformed mineral fibre, compression fit.

2.6 FIRE AND SMOKE ASSEMBLY IDENTIFICATION

.1 Regulatory requirements: Comply with the requirements of the Authority Having Jurisdiction.

.2 Adhered fire and smoke assembly identification signs: Permanent, printed vinyl or paper sign with factory applied adhesive backing.

.3 Languages: Provide markings in English.

Part 3 Execution

3.1 EXAMINATION

.1 Verify openings are ready to receive the work of this section.

.2 Verify that site dimensions are as shown on the Drawings, system designs including EJs and EFRRAs, and the manufacturer's recommendations.

3.2 PREPARATION

.1 Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

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.2 Remove incompatible materials that could adversely affect bond.

3.3 INSTALLATION - GENERAL

.1 Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

.2 Do not cover installed firestopping until inspected by authorities having jurisdiction.

.3 Install labelling.

3.4 INSTALLING PENETRATION FIRESTOPS

.1 Comply with through-penetration firestop manufacturer's installation instructions and system design.

.2 Coordinate with other trades to ensure that penetrating items have been permanently installed.

.3 Coordinate the work to ensure that partitions and other construction that conceal penetrations are not erected prior to installation of firestop systems.

.4 Install packing materials and other accessories in accordance with manufacturer's installation instructions and system design.

.5 Install fill, void, and cavity materials for through-penetration firestop systems as recommended by the manufacturer and system design:

.1 Clean surfaces as recommended by manufacturers' written instructions.

.2 Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

.3 Install materials to contact and adhere to substrates formed by openings and penetrating items.

.4 Finish to produce smooth, uniform surfaces.

3.5 INSTALLING FIRESTOP JOINT SYSTEMS

.1 Comply with joint system firestop manufacturer's installation instructions and system design.

.1 Install joint forming materials to support firestop materials during application.

.2 Position to produce cross-sectional shapes and depths of installed firestop material relative to joint widths, permit mechanical joint movement capability, and develop fire-resistance rating required.

.2 Install system designs that result in firestop materials:

.1 Directly contacting and fully wetting joint substrates.

.2 Completely filling recesses provided for each joint configuration.

.3 Tool or smooth non-sag firestop materials to manufacturer's installation instructions. Form smooth, uniform beads, and to:

.1 Produce fire-resistance-rating.

.2 Eliminate air pockets.

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.3 Ensure contact and adhesion with sides of joint.

3.6 INSTALLING PERIMETER FIRE BARRIER SYSTEMS

.1 Comply with firestop manufacturer’s installation instructions and system design.

.2 Install metal framing, curtainwall insulation, mechanical attachments, safing materials and other firestop system components as shown on system design.

3.7 INSTALLING FIRE AND SMOKE ASSEMBLY IDENTIFICATION

.1 Locate markings as required by Authority Having Jurisdiction.

.2 Install adhered markings in accordance with manufacturer's instructions.

.3 Install neatly, with horizontal edges level.

.4 Protect from damage until Date of Substantial Performance; repair or replace damaged markings.

3.8 CLEANING

.1 Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION

.1 Protect adjacent surfaces from damage by material installation.

.2 Protect firestopping during and after curing period from damage during construction.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Non-sag gunnable joint sealants.

.2 Self-levelling pourable joint sealants.

.3 Joint backings and accessories.

.4 Owner-provided site quality control.

1.2 RELATED REQUIREMENTS

.1 Section 07 25 00 - Weather Barriers: Sealants required in conjunction with air barriers and air/vapour barriers.

.2 Section 07 84 00 - Firestopping: Firestopping sealants.

.3 Section 07 91 00 - Preformed Joint Seals: Precompressed foam, gaskets, and strip seals.

.4 Section 07 95 13 - Expansion Joint Cover Assemblies: Sealants forming part of expansion joint cover assemblies.

.5 Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

.6 Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.3 REFERENCE STANDARDS

.1 ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.

.2 ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.

.3 ASTM C834 - Standard Specification for Latex Sealants 2017.

.4 ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

.5 ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems 2016.

.6 ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

.7 ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2008 (Reapproved 2012).

.8 ASTM C1311 - Standard Specification for Solvent Release Sealants 2014.

.9 ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness 2015e1.

.10 SCAQMD 1168 - Adhesive and Sealant Applications 1989 (Amended 2017).

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures

.2 Product data for sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

.1 Physical characteristics, including movement capability, VOC content, hardness, cure time, and colour availability.

.2 List of backing materials approved for use with the specific product.

.3 Substrates that product is known to satisfactorily adhere to and with which it is compatible.

.4 Substrates the product should not be used on.

.5 Substrates for which use of primer is required.

.6 Substrates for which laboratory adhesion or compatibility testing is required.

.3 Product data for accessory products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

.4 Colour cards for selection: Where sealant colour is not specified, submit manufacturer's colour cards showing standard colours available for selection.

.5 Preconstruction laboratory test reports: Submit at least four weeks prior to start of installation.

.6 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

.2 Preconstruction laboratory testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

.1 Adhesion testing: In accordance with ASTM C794.

.2 Compatibility testing: In accordance with ASTM C1087.

.3 Stain testing: In accordance with ASTM C1248; required only for stone substrates.

.4 Allow sufficient time for testing to avoid delaying the work.

.5 Deliver to manufacturer sufficient samples for testing.

.6 Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

.7 Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

.3 Owner may employ an independent testing agency to perform the site quality control inspection and testing.

.1 Contractor shall cooperate with testing agency and repair failures discovered and destructive test location damage.

Part 2 Products

2.1 JOINT SEALANT APPLICATIONS

.1 Scope:

.1 Exterior joints: Seal open joints, whether or not the joint is indicated on Drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.

.1 Wall expansion and control joints.

.2 Joints between door, window, and other frames and adjacent construction.

.3 Joints between different exposed materials.

.4 Openings below ledge angles in masonry.

.2 Interior joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.

.1 Joints between door, window, and other frames and adjacent construction.

.3 Do not seal the following types of joints.

.1 Intentional weepholes in masonry.

.2 Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.

.3 Joints where sealant is specified to be provided by manufacturer of product to be sealed.

.4 Joints where installation of sealant is specified in another section.

.5 Joints between suspended panel ceilings/grid and walls.

.2 Exterior joints: Use non-sag, non-staining high-performance hybrid sealant, unless otherwise indicated.

.1 Lap joints in sheet metal fabrications: Butyl rubber, non-curing.

.2 Lap joints between manufactured metal panels: Butyl rubber, non-curing.

.3 Control and expansion joints in concrete paving: Self-levelling polyurethane "traffic-grade" sealant.

.3 Interior joints: Use non-sag siliconized acrylic latex sealant, unless otherwise indicated.

.1 Joints between fixtures in wet areas and floors, walls, and ceilings: Mildew-resistant silicone sealant; white.

.2 Narrow control joints in interior concrete slabs: Self-levelling polyurea sealant.

.3 Other floor joints: Self-levelling polyurethane "traffic-grade" sealant.

.4 Interior wet areas include washrooms, shower areas, kitchens, and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items

2.1 JOINT SEALANTS - GENERAL

.1 Sealants and primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

.2 Compatibility: Provide joint sealants, backings and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer, based on testing and field experience.

2.2 NON-SAG JOINT SEALANTS

.1 High-performance hybrid sealant: ASTM C920, Grade NS, Uses T, NT, M, A and O; not expected to withstand continuous water immersion or traffic.

.1 Movement capability: Plus and minus 50 percent, minimum.

.2 Non-staining to porous stone: Non-staining to light-coloured natural stone when tested in accordance with ASTM C1248.

.3 Colour: To be selected by Consultant from manufacturer's standard range.

.4 Cure type: Single-component, neutral moisture curing.

.5 Service temperature range: Minus 40 to plus 85 degrees C.

.6 Basis-of-Design Product:

.1 MasterBuilders Solutions; MasterSeal NP 100.

.2 Mildew-resistant silicone sealant: ASTM C920, Grade NS, Uses M and A; single-component, mildew resistant; not expected to withstand continuous water immersion or traffic.

.1 Colour: White.

.2 Cure type: Single-component, neutral moisture curing

.3 Products:

.1 Dow; Dowsil 785N.

.2 Pecora; 898NST.

.3 Siliconized acrylic latex: Water-based; ASTM C834, single-component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

.1 Colour: Standard colours matching finished surfaces, Type OP (opaque).

.2 Products:

.1 Tremco Commercial Sealants

.2 Waterproofing; Tremflex 834.

.3 Pecora; AC-20 Silicone.

.4 Franklin; Titebond Painters Plus.

.5 Master Builders Solutions; MasterSeal NP 520

.4 Non-curing butyl sealant: Solvent-based; ASTM C1311; single-component, non-sag, non-skinning, non-hardening, non-bleeding; vapour-impermeable; intended for fully concealed applications.

2.3 SELF-LEVELLING SEALANTS

.1 Self-levelling polyurethane sealant for horizontal expansion joints: ASTM C920, Grade P, Uses T, NT, M, A and O; multi-component; explicitly approved by manufacturer for interior and exterior use in horizontal expansion joints, and suitable for pedestrian and vehicular traffic exposure.

.1 Movement capability: Plus and minus 25 percent, minimum.

.2 Hardness range: 30 to 35, Shore A, when tested in accordance with ASTM C661.

.3 Colour: To be selected by Consultant from manufacturer's standard range.

.4 Service temperature range: Minus 40 to 82 degrees C.

.5 Basis of Design Product:

.1 Master Builders Solutions, MasterSeal SL2.

.2 Semi-rigid self-levelling polyurea joint filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

.1 Durometer hardness, Type A: 80, minimum, after seven days when tested in accordance with ASTM D2240.

.2 Colour: To be selected by Consultant from manufacturer's standard colours.

.3 Joint width, minimum: 3 mm.

.4 Joint width, maximum: 6 mm.

.5 Joint depth: Provide product suitable for joints up to 50 mm, or in accordance with manufacturer's instructions.

.6 Products:

.1 Metzger/McGuire; Edge-Pro 80.

.2 Euclid; Euco QWIKjoint UVR.

.3 Versaflex; SL/85.

2.4 ACCESSORIES

.1 Backer rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

.2 Backing tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

.3 Masking tape: Self-adhesive, non-absorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

.4 Joint cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

.5 Primers: Type recommended by sealant manufacturer to suit application; non-staining.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that joints are ready to receive work.

.2 Verify that backing materials are compatible with sealants.

.3 Verify that backer rods are of the correct size.

3.2 PREPARATION

.1 Remove loose materials and foreign matter that could impair adhesion of sealant.

.2 Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

.3 Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

.4 Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

.5 Concrete floor joints that will be exposed in completed work: Test joint filler in inconspicuous area to verify that it does not stain or discolour slab.

3.3 INSTALLATION

.1 Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

.2 Perform installation in accordance with ASTM C1193.

.3 Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

.4 Install bond breaker backing tape where backer rod cannot be used.

.5 Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

.6 Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

.7 Non-sag sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

.8 Concrete floor joint filler: After full cure, shave joint filler flush with top of concrete slab.

3.4 SITE QUALITY CONTROL

.1 Owner may employ an independent testing agency to perform site quality control inspection and testing.

.2 Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Non-fire-rated hollow metal doors and frames.

.2 Hollow metal frames for wood doors.

.3 Fire-rated hollow metal doors and frames.

.4 Thermally insulated hollow metal doors with frames.

1.2 RELATED REQUIREMENTS

.1 Section 08 71 00 - Door Hardware.

.2 Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

1.3 ABBREVIATIONS AND ACRONYMS

.1 CSDMA - Canadian Steel Door Manufactures Association

.2 NFPA - National Fire Protection Association.

.3 ULC - Underwriters Laboratories of Canada.

1.4 REFERENCE STANDARDS

.1 ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2014.

.2 ASTM A653/A653M - Standard Specification for Steel Sheet,Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

.3 ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable 2018.

.4 ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

.5 CAN/ULC S104 - Standard Method for Fire Tests of Door Assemblies 2010.

.6 CSDMA Commercial Steel Doors and Frames - Canadian Steel Door Manufacturers Association Commercial Steel Doors and Frames Recommended Specification 2009.

.7 CSDMA Storage and Installation Guide - Guide Specification for Installation and Storage of Hollow Metal Doors and Frames 2012.

.8 ITS (DIR) - Intertek Testing Services, Directory of Listed Products current edition.

.9 NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2016.

.10 ULC (DIR) - Online Certifications Directory (Canada) Current Edition.

1.5 SUBMITTALS

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.1 Product data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

.2 Shop Drawings: Include the following:

.1 Elevations of each door design.

.2 Details of doors, including vertical and horizontal edge details and metal thicknesses.

.3 Frame details for each frame type, including dimensioned profiles and metal thicknesses.

.4 Locations of reinforcement and preparations for hardware.

.5 Details of each different wall opening condition.

.6 Details of anchorages, joints, field splices, and connections.

.7 Details of accessories.

.8 Details of mouldings, removable stops and glazing.

.9 Details of conduit and preparations for power, signal, and control systems.

.3 Manufacturer's qualification statement.

1.1 QUALITY ASSURANCE

.1 Manufacturer qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

.2 Manufacturer: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:

.1 Fabricate work of this Section to meet the requirements of CSDMA Commercial Steel Doors and Frames as a minimum and as further modified in this section.

.2 Fabricator: Member in good standing of the Canadian Steel Door Manufactures Association (CSDMA).

.3 Installer qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

.4 Testing agencies: Provide doors produced under label service program of a testing agency acceptable to Authorities Having Jurisdiction, and as follows:

.1 Steel fire rated doors and frames: Labelled and listed by an organization accredited by Standards Council of Canada for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled:

.1 List by nationally recognized agency having factory inspection service and construct as detailed in Follow up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.2 Fabricate all rated doors, frames and screens to labelling

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authority standard.

.3 Affix appropriate labels to each opening required as indicated on door schedule on Drawings, and as follows.

.1 At standard size openings: Fire endurance rating.

.3 Maintain at project site copies of reference standards relating to installation of products specified.

1.2 DELIVERY, STORAGE, AND HANDLING

.1 Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Requirements for hollow metal doors and frames:

.1 Steel used for fabrication of doors and frames shall comply with one or more of the following requirements: galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot- rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.

.2 Exterior door top closures: Flush end closure channel, with top and door faces aligned.

.3 Door edge profile: Manufacturers standard for application indicated.

.4 Typical door face sheets: Flush.

.5 Glazed lights: Non-removable stops on non-secure side; sizes and configurations as indicated on Drawings. Style: Manufacturer's standard.

.6 Zinc coating for typical interior and exterior locations: Provide metal components zinc-coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with F180/A60 coating.

.1 Stretcher levelled standard of flatness when used for face sheets.

.2 Combined requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.2 HOLLOW METAL DOORS

.1 Door finish: Factory primed and site finished.

.2 Fabricate steel doors rigid, neat in appearance, and free from defects including warp and buckle; 45 mm thickness of types and sizes indicated in Door, and Frame Schedule on Drawings, and as follows:

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.1 Fabricate door faces of all steel doors without visible seams, free of scale, pitting, coil brakes, buckles and waves.

.2 Form edges true and straight with minimum radius suitable for thickness of steel used.

.3 Bevel lock and hinge edges 3 mm in 50 mm; confirm requirement with builder's hardware or door swing that could dictate a different bevel.

.4 Provide top and bottom of doors with inverted, recessed, nominal 1.60 mm steel end channels, welded to each face sheet at 150 mm on centre.

.3 Type HMI, Exterior doors: Thermally insulated.

.1 Fabricated in compliance with ANSI/SDI A250.8 and as follows:

.1 Face thickness: Minimum 1.30 mm.

.2 Insulation stiffened core: Insulated and sound deadened with polystyrene or polyisocyanurate at choice of manufacturer, core laminated under pressure to each face sheet.

.3 Longitudinal edges: Mechanically interlocked, edge seams spot welded, filled with automotive body filler and sanded flush.

.2 Door thermal resistance: RSI-Value of 0.48.

.4 Interior doors, non-fire rated:

.1 Flush, lock seam construction, hollow steel doors fabricated in accordance with CSDMA Commercial Steel Doors and Frames Manufacturing Specifications for Doors and Frames, and as follows:

.1 Face sheets: Minimum 1.30 mm base steel sheet thickness.

.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet.

.3 Longitudinal edges: Mechanically interlocked, edge seams spot welded, filled with automotive body filler and sanded flush.

.5 Fire-rated doors: Flush, lock seam construction, hollow steel doors fabricated in compliance with CAN/ULC S104 and NFPA 80, and as follows:

.1 Face sheets: Minimum nominal 1.60 mm base steel sheet thickness.

.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet.

.3 Longitudinal edges: Mechanically interlocked, edge seams spot welded, filled with automotive body filler and sanded flush.

.4 Fire rating: As indicated on Door Schedule, tested in accordance with CAN/ULC S104.

.5 Provide units listed and labeled by ULC (DIR) or ITS (DIR).

.1 Attach fire rating label to each fire rated unit.

2.3 HOLLOW METAL FRAMES

.1 Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

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.2 Frame finish: Same as hollow metal door.

.3 Exterior door frames: Face welded type, thermally broken.

.1 Frame metal thickness: 1.7 mm, minimum.

.2 Weatherstripping: Separate, see Section 08 71 00.

.4 Interior door frames, non-fire rated: Face welded type.

.5 Frame metal thickness: 1.7 mm, minimum. Door frames, fire-rated: Face welded type.

.1 Fire rating: Same as door, labeled.

.6 Frames for wood doors: Comply with frame requirements in accordance with corresponding door.

.7 Transom bars: Removable where indicated, of profile same as jamb and head.

.8 Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

.9 Frames in masonry walls: Size to suit masonry coursing with head member 100 mm high to fill opening without cutting masonry units.

.10 Frames wider than 1220 mm: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.4 HARDWARE REINFORCEMENT

.1 Hardware reinforcement: Cold or hot rolled steel, galvanneal coated. Minimum base steel thickness in accordance with CSDMA Recommended Specifications for Commercial Steel Door and Frame Products, Table 1 – Minimum Steel Gauges for Component Parts, except as follows:

.1 Hinge reinforcement: minimum 5 mm thick.

.2 Surface mounted hardware reinforcement: minimum 2.5 mm thick.

.3 Flush bolt reinforcement: minimum 5 mm thick.

2.5 FINISHES

.1 Remove weld slag and splatter from exposed surfaces.

.2 Fill and sand smooth tool marks, abrasions, and surface blemishes to present smooth uniform surfaces.

.3 Shop apply zinc rich primer to repair damaged zinc coatings arising from fabrication.

.4 Bituminous coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.6 ACCESSORIES

.1 Glazing: As specified in Section 08 80 00, site-installed.

.2 Removable stops: Formed sheet steel, shape as indicated on Drawings, mitred or

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butted corners; prepared for countersink style tamper proof screws.

.3 Grout for frames: Portland cement grout with maximum 100 mm slump for hand troweling; thinner pumpable grout is prohibited.

.4 Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

.5 Temporary frame spreaders: Provide for factory- or shop-assembled frames.

.6 Frame anchors: Provide frame anchors appropriate to wall, floor and frame construction. Provide number and location of anchors in accordance with CSDMA Commercial Steel Doors and Frames.

.7 For anchors built into exterior walls, provide hot dip galvanized anchors.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify that opening sizes and tolerances are acceptable.

.3 Verify that finished walls are in plane to ensure proper door alignment.

3.2 PREPARATION

.1 Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.3 INSTALLATION

.1 Install doors and frames in accordance with reviewed Shop Drawings, CSDMA Storage and Installation Guide, manufacturer's instructions, and related requirements of specified door and frame standards.

.2 Install fire rated units in accordance with NFPA 80.

.3 Coordinate frame anchor placement with wall construction.

.4 Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

.5 Install door hardware as specified in Section 08 71 00.

.6 Comply with glazing installation requirements of Section 08 80 00.

.7 Coordinate installation of electrical connections to electrical hardware items.

3.4 TOLERANCES

.1 Clearances between door and frame: Comply with related requirements of specified frame standards in accordance with CSDMA Storage and Installation Guide.

.2 Maximum diagonal distortion: 1.6 mm measured with straight edge, corner to

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corner.

3.5 ADJUSTING

.1 Adjust for smooth and balanced door movement.

3.6 SCHEDULE

.1 Refer to Door and Frame Schedule on Drawings.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Non-fire-rated aluminum coiling counter doors and operating hardware.

1.2 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal fabrications; door jamb and header

.2 Section 06 10 00 – Rough carpentry: door jamb and header

.3 Section 08 71 00 – Door Hardware: Cylinder cores and keys.

.4 Section 09 91 00 – Painting

1.3 REFERENCE STANDARDS

.1 ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

.2 ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide information on door construction, components, materials, and finishes.

.3 Shop Drawings: Indicate dimensions and required tolerances, connection details, anchorage spacing, hardware types and locations, and installation details.

.4 Samples: Submit two slats, 102 mm long, illustrating material, shape, colour and finish texture.

.5 Manufacturer's instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.

.6 Operation and maintenance data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

Part 2 Products

2.1 MANUFACTURERS

.1 Coiling counter aluminum doors:

.1 Dynamic Closures; Mini Rollup Shutter Model EX40.

.2 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.2 COILING COUNTER DOORS

.1 Refer to Drawings for sizes.

.2 Curtain

.1 Horizontal Slats: Extruded single wall aluminum interlocking flat slats. Slats width shall be 60 mm high by 1.48 mm wide extruded wall thickness.

.3 Bottom Bar: Double-walled extruded aluminum with polypropylene felt weather-stripping on bottom to seal for light and sound.

.4 Hood: 18-gauge (.040) thickness preformed sheet aluminum.

.5 Guides: Extruded aluminum 59mm by 29mm fitted with two rows of polypropylene felt weather stripping for quiet operation and to cushion both sides of curtain.

.6 Counterbalance: Helical torsion spring assembly set in roll formed galvanized steel pipe of recommended size by manufacturer to support curtain with a maximum deflection of -0.8mm per 305mm of curtain width.

.7 Bracket Plates: Minimum 5mm thick die cast aluminum to support counterbalance assembly, curtain and hood.

.8 Operation:

.1 Manual Push-up

.9 Lock: Keyed cylinder centred on interior

.10 Finish:

.1 Exposed Aluminum Part: Multi-coat baked enamel polyester resin coating colours as follows: White

Part 3 Execution

3.1 EXAMINATION

.1 Verify that opening sizes, tolerances and conditions are acceptable.

3.2 INSTALLATION

.1 Install units in accordance with manufacturer's instructions and approved shop drawings.

.2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

.4 Fit and align assembly including hardware; level and plumb, to provide smooth operation.

3.3 ADJUSTING

.1 Adjust operating assemblies for sooth and noiseless operation.

3.4 CLEANING

.1 Clean installed components.

.2 Remove labels and visible markings.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Aluminum-framed interior storefront, with vision glass.

.2 Aluminum doors and frames.

.3 Weatherstripping.

1.2 RELATED REQUIREMENTS

.1 Section 08 42 29 – Automatic Entrances: Door operators.

.2 Section 08 71 00 – Door Hardware: Hardware items other than specified in this section.

.3 Section 08 80 00 – Glazing: Glass and glazing accessories.

1.3 REFERENCE STANDARDS

.1 AAMA 609 610 – Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.

.2 AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum 2020.

.3 AAMA CW-10 – Care and Handling of Architectural Aluminum From Shop to Site 2015.

.4 ANSI H35.1/H35.1M – American National Standard Alloy and Temper Designation Systems for Aluminum 2017.

.5 ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

.6 ASTM B209M – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.

.7 ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

.8 ASTM B221M – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

.9 ASTM E330/E330M – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

.3 Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

.4 Installer's qualification statement.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Handle products of this section in accordance with AAMA CW-10.

.2 Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.7 SITE CONDITIONS

.1 Site measurements: Verify actual locations of structural supports for aluminum framed entrance and storefront systems by site measurements before fabrication and indicate measurements on Shop Drawings.

Part 2 Products

2.1 MANUFACTURERS - FRAMING FOR MONOLITHIC GLAZING

.1 Centre-set style:

.1 Alumicor; FlushGlaze TL 1800.

.2 Kawneer; VersaGlaze 450.

.3 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.2 BASIS OF DESIGN -- SWINGING DOORS

.1 Wide stile, monolithic glazing:

.1 Alumicor; Canadiana 600.

.2 Kawneer; Standard Entrance 500.

.3 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.1 STOREFRONT

.1 Aluminum-framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related trim, anchorage and attachment devices.

.1 Glazing rabbet: For 6 mm monolithic glazing.

.2 Vertical mullion dimensions: 64 mm by 114 mm.

.3 Finish: Class I Clear anodized.

.1 Factory finish all surfaces that will be exposed in completed assemblies.

.2 Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

.4 Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.

.5 Installation method: Single span, interior storefront, and ribbon.

.6 Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.

.7 Perimeter clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

.2 Performance requirements:

.1 Provide aluminum framed entrance and storefront systems, including anchorage, capable of withstanding, without failure, the effects of the following:

.1 Structural loads.

.2 Movements of supporting structure, including deflection from uniformly distributed and concentrated live loads.

.3 Dimensional tolerances of building frame and other adjacent construction.

.2 Failure of performance requirements will be considered to include the following:

.1 Deflection exceeding specified limits.

.2 Framing members transferring stresses, including those caused by structural movements, to glazing.

.3 Loosening or weakening of fasteners, attachments, and other components.

.4 Failure of operating units to function properly.

.3 Wind loads: Design and size components to withstand the wind load requirements for interior walls and partitions in accordance with the requirements of the applicable code.

.1 Member deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

2.2 COMPONENTS

.1 Aluminum framing members: Tubular aluminum sections.

.1 Glazing stops: Flush.

.2 Glazing: As specified in Section 08 80 00.

.1 For interior framing: Fully tempered safety glass, 6 mm thick.

.3 Swing doors: Glazed aluminum.

.1 Glazing stops: Manufacturer's standard shape.

.2 Finish: Same as storefront.

2.3 MATERIALS

.1 Aluminum: Materials recommended by manufacturer for type of use and finish indicated, and as follows:

.1 Sheet and plate: Conform to ASTM B209/ASTM B209M, and ANSI H35.1/H35.1M, AA1100-H14, or AA5005-H32 or H34, anodizing quality.

.2 Extruded bars, rods, profiles, and tubes: Conform to ASTM B221/ASTM B221M, and ANSI H35.1/H35.1M, AA6063-T5 or T6, anodizing quality

.2 Brackets and reinforcements: Manufacturer's standard high strength aluminum and non-

staining, non-ferrous shims for aligning system components.

.3 Fasteners: Stainless steel.

.4 Fasteners and accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials:

.1 Use self locking devices where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration.

.2 Reinforce members as required to receive fastener threads.

.3 Use only concealed fasteners, unless use of exposed fasteners has been accepted in writing by the Consultant.

.4 Finish: Match framing system.

.5 Glazing gaskets: Type to suit application.

.6 Glazing accessories: As specified in Section 08 80 00.

2.4 FINISHES

.1 Class I Clear Anodized Finish: M12C12A44 Clear anodic coating not less than 0.7 mils thick.

2.5 HARDWARE

.1 Manufacturer’s heavy duty hardware units in sizes and types as required to meet entrance use as indicated on Drawings, with the following opening force limitations:

.1 Egress doors: Maximum 135 N to set door in motion and not more than 70 N to open door to minimum required width.

.2 Accessible interior doors: Maximum 20 N to operate door through entire range of movement.

.3 Latches and exit devices: Not more than 70 N required to release latch.

.2 For each door, include weatherstripping.

.3 Other door hardware: As specified in Section 08 71 00.

.4 Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

Part 3 Execution

3.1 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify that wall openings and adjoining air and vapour seal materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Install wall system in accordance with manufacturer's instructions.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities

.3 Provide alignment attachments and shims to permanently fasten system to building structure.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

.5 Install glass in accordance with Section 08 80 00, using dry glazing method.

.6 Entrances:

.1 Install entrance framing to produce smooth operation and tight fit at contact points.

.2 Install exterior entrance framing to produce tight fit at weather stripping and weather tight closure.

.3 Install site applied surface mounted hardware in accordance with hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

.7 Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

.1 Maximum variation from plumb: 1.5 mm per 1 m non-cumulative or 1.5 mm per 3 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Location and plane: Limit variation from true location and plane to 3 mm in 3660 mm; 6 mm over total length.

.4 Diagonal measurements: Limit difference between diagonal measurements to 3 mm.

3.4 ADJUSTING

.1 Adjust operating hardware for smooth operation.

.2 Adjust closers designated as accessible for people with disabilities to provide a 3 second closer sweep period for doors to move from a 70 degree open position to 75 mm from latch measured to the leading door edge.

3.5 CLEANING

.1 Remove protective material from pre-finished aluminum surfaces.

.2 Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 610.

3.6 PROTECTION

.1 Protect installed products from damage until Date of Substantial Performance.

.2 Protect aluminum finishes and glazing during erection against disfiguration, contamination or damage by abuse or harmful materials.

.3 Install protective cover where exposure to damage is critical.

.4 Mark each light with large cross or other symbol to make glass obvious and noticeable to other trades after glass is installed, using substance that will not stain, mark or shadow glass either by itself or by reaction with sunlight, moisture or the environment; masking

tape is not considered as a suitable material; replace glass units marked with masking tape.

END OF SECTION

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Part 1 General

1. SECTION INCLUDES

.1 Factory fabricated fibreglass windows with fixed and operating sash.

.2 Glazed by factory.

.3 Operating hardware.

2. RELATED REQUIREMENTS

.1 Section 07 25 00 – Weather Barriers

.2 Section 07 92 00 – Joint Sealants

.3 Section 08 80 00 – Glazing

3. REFERENCE STANDARDS

.1 AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/ Specification for windows, doors, and skylights 2017.

.2 ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2015.

.3 ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

.4 ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).

.5 ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights 2007 (Reapproved 2016).

.6 ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.

.7 ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact 2017.

.8 CAN/CSA A440.2 - Fenestration Energy Performance / User Guide to CSA A440.2-14, Fenestration Energy Performance 2014.

.9 LBNL WINDOW - Lawrence Berkeley National Laboratory WINDOW 7.6.

.10 CAN/CGSB 12.20 - Structural Design of Glass for Buildings 1989.

.11 NBC - National Building Code of Canada 2020.

.12 NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

.13 NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2014, with Errata (2017).

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.14 NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.

4. ADMINISTRATIVE REQUIREMENTS

.1 Preinstallation Meeting: Convene one week before starting work of this section.

.1 Review, discuss, and coordinate the interrelationship of fibreglass windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.

.2 Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.

.3 Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

5. SUBMITTALS

.1 See Section 01 30 00 – Submittal Procedures.

.2 Product Data: Provide component dimensions, anchors, fasteners, glass, internal drainage details, and hardware.

.3 Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements. Use same designations indicated on Drawings.

.4 Samples:

.1 Submit one representative model of each type of window.

.2 Submit two samples for each exposed product and for each colour specified.

.5 Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.

.6 Grade Substantiation: Prior to submitting Shop Drawings or starting fabrication, submit one of the following showing compliance with specified grade:

.1 Evidence of CSA Certification.

.2 Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

.7 Manufacturer's qualification statement.

.8 Installer's qualification statement.

.9 Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

.1 See Section 01 60 00 – Common Product Requirements

.2 Extra insulated glass units: One of each size used on Project.

.10 Warranty documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

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6. QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

.2 Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

7. DELIVERY, STORAGE, AND HANDLING

.1 Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

.2 Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

8. SITE CONDITIONS

.1 Do not install sealants when ambient temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and 24 hours after installation of sealants.

9. WARRANTY

.1 See Section 01 78 00 – Closeout Submittals.

.2 Correct defective Work within a 10 year period after Date of Substantial Performance.

.3 Provide 10 year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of colour finish.

Part 2 Products

1. MANUFACTURERS

.1 Fibreglass Windows: Acceptable Manufacturers:

.1 Duxton Windows: Fibrewall

2. WINDOW UNITS

.1 Fibreglass Windows: Hollow, tubular, multi-layer fibre reinforced material; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.

.1 Configuration: As indicated on Drawings.

.2 Product Type: inward acting FW - Fixed window in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

.3 Colour: Black

.4 Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

.5 System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

.6 Thermal Movement: Design to accommodate thermal movement caused by 49 degrees C temperature change without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.

3. PERFORMANCE REQUIREMENTS

.1 Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:

.1 Performance Class (PC): CW.

.2 Determine thermal performance in conformance with CAN/CSA A440.2, Thermal Performance Evaluation of Windows and Sliding Glass Doors, and Appendix A – Overview of the Procedure for Determining the U Value by Computer Simulation.

.3 Design Pressure (DP):

.1 Positive Design Pressure: 1920 Pa.

.2 Negative Design Pressure: 1920 Pa

.4 Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.

.5 Overall Thermal Transmittance (USI-value): 1.0, maximum, including glazing, measured on window sizes required for this project.

.6 Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of minimum 290 Pa.

.7 Air Leakage: Maximum of 0.5 L/sec/sq m at 300 Pa differential pressure, when tested in accordance with ASTM E283.

.8 Forced Entry Resistance: Comply with ASTM F588 for measured performance of Grade 10 in accordance with requirements.

4. PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

.1 Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.

.1 Comply with CAN/CGSB 12.20 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.

.2 Ultimate Limit States: Positive and negative pressure acting normal to plane of glass using wind load requirements of Section 4.1.7 of the National Building Code NBC for Normal Importance Category using Importance Factor (Iw) accounting for normal wind load and gust velocities.

.3 Reference Velocity Pressure: Velocity pressure (q) located in National Building Code (NBC) Structural Commentaries, Wind Load and Effects, (Part 4 of Division B), based on probability of being exceeded in any one year of 1 in 50.

.4 Limit of Centre of Glass Deflection: Limit centre of glass deflection to a maximum of 1/60 and not exceeding 19 mm relative to the undeflected glass plane.

.5 Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load and as required to maintain full contact with glazing throat.

.6 Glass thicknesses listed are minimum.

.7 Multipliers: Modify glass thicknesses based on substituting heat treated or laminated glass configurations as required to obtain the most economical glass assembly.

.8 Confirm glass thicknesses by analyzing project loads and in-service conditions and provide glass in strengths (annealed or heat treated) and actual thickness required to meet deflection criteria.

.2 Vapour Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapour retarder and air barrier.

.1 In conjunction with vapour retarder and joint sealer materials described in other sections.

.1 See Section 07 25 00 – Weather Barriers.

.2 To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapour retarder and air barrier seal.

.3 To maintain a continuous vapour retarder and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

.3 Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:

.1 Center of Glass U-Value: Comply with NFRC 100 using LBNL WINDOW computer program.

.2 Centre of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using LBNL WINDOW computer Program

.3 Solar Optical Properties: Comply with NFRC 300 test method.

2.5 COMPONENTS

.1 Frames by Window Type

.1 Type 02 and Type 03: 47mm wide by 84mm deep profile

.1 Colour: Black

.2 Fibreglass applied glass stops of snap-in type.

.3 Frame Corners: Mitered and joined with nylon corner locks; sealed.

.4 Mullion: profile to match framing.

.5 Perimeter Trims for Windows

.1 Colour: Red

.6 Interior Profile: Cellular PVC for all window types.

.7 Fasteners: Stainless steel.

.8 Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

.1 Refer to Section 07 92 00 for additional requirements.

2.6 GLASS UNITS

.1 Manufacturers:

.1 Fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

.2 Glass Units: Refer to Section 08 80 00 – Glazing. Types as indicated.

2.7 FABRICATION

.1 Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.

.2 Form sills in one piece. Slope sills for wash.

.3 Form snap-in glass stops, closure moulds, weather stops, and flashings for tight fit into window frame section.

.4 Form weather stop flange to perimeter of unit.

.5 Fabricate components with minimum clearances and shim spacing around perimeter of assembly yet enabling installation and dynamic movement of perimeter seal.

.6 Arrange fasteners to be concealed from view.

.7 Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.

.8 Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.

.9 Double weatherstrip operable units.

.10 Factory glaze window units.

Part 3 Execution

3.1 EXAMINATION

.1 Verify wall openings and adjoining air and vapour seal materials are ready to receive work of this Section.

3.2 INSTALLATION

.1 Install windows in accordance with manufacturer's instructions.

.2 Install windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

.3 Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

.4 Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

.5 Set sill members and sill flashing in continuous bead of sealant.

.6 Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.7 Coordinate installation with seal of perimeter air and vapour barrier materials as specified in Section 07 25 00.

3.3 TOLERANCES

.1 Maximum Variation from Level or Plumb: 1.5 mm/m non-cumulative or 3 mm/3 m, whichever is less.

3.4 ADJUSTING

.1 Adjust hardware for smooth operation and secure weathertight closure.

3.5 CLEANING

.1 Remove protective material from pre-finished surfaces.

.2 Wash surfaces by method recommended and acceptable to window manufacturer, rinse and wipe surfaces clean.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Hardware for wood, aluminum, and hollow metal doors.

.2 Hardware for fire-rated doors.

.3 Electrically operated and controlled hardware.

.4 Lock cylinders for doors that hardware is specified in other sections.

1.2 RELATED REQUIREMENTS

.1 Section 08 06 71 – Door Hardware Schedule

1.3 REFERENCE STANDARDS

.1 BHMA A156.28 - American National Standard for Recommended Practices for Mechanical Keying Systems 2013.

.2 CAN/ULC S104 - Standard Method for Fire Tests of Door Assemblies 2010.

.3 CSA B651 - Accessible Design for the Built Environment 2018.

.4 CSA C22.1 - Canadian Electrical Code, Part 1 (25th Edition), Safety Standard for Electrical Installations 2021.

.5 DHI (HS) – Sequence and Format for the Hardware Schedule 1996.

.6 DHI (KSN) – Keying Systems and Nomenclature 1989.

.7 ITS (DIR) – Intertek Testing Services, Directory of Listed Products current edition.

.8 NFPA 80 – Standard for Fire Doors and Other Opening Protectives 2016.

.9 ULC (DIR) – Online Certifications Directory (Canada) Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

.2 Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

.3 Preinstallation meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:

- .1 Consultant.
- .2 Installer's architectural hardware consultant.
- .3 Hardware installer.
- .4 Owner's security consultant.

.4 Submit templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

.5 Keying requirements meeting:

.1 Attendance required:

.1 Contractor.

.2 Owner.

.3 Consultant.

.4 Installer's architectural hardware consultant.

.5 Hardware Installer.

.6 Owner's Security Consultant.

.2 Agenda:

.1 Establish keying requirements.

.2 Verify locksets and locking hardware are functionally correct for project requirements.

.3 Verify that keying and programming complies with project requirements.

.4 Establish keying submittal schedule and update requirements.

.3 Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:

.1 Access control requirements.

.2 Key control system requirements.

.3 Flow of traffic and extent of security required.

.4 Record minutes and distribute copies within two days after meeting to participants, with two copies to Consultant, Owner, participants, and those affected by decisions made.

.5 Deliver established keying requirements to manufacturers.

1.5 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be supplied for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

.3 Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.

.1 Prepared by or under supervision of architectural hardware consultant.

.2 Comply with DHI using door numbers and hardware set numbers as indicated in construction documents.

.3 List groups and suffixes in proper sequence.

.4 Provide complete description for each door listed.

.5 Provide manufacturer's and product names, and catalogue numbers; include functions, types, styles, sizes and finishes of each item.

.6 Include account of abbreviations and symbols used in schedule.

.4 Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:

.1 Prepared by or under supervision of architectural hardware consultant and electrified hardware consultant.

.2 Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.

.3 Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related coloured wire connections to each device.

.5 Manufacturer's installation instructions: Indicate special procedures.

.6 Maintenance data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

.1 Submit manufacturer's parts lists and templates.

.7 Keying schedule:

.1 Submit copy of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

.8 Installer's qualification statement.

.9 Supplier's qualification statement.

.10 Project record documents: Record actual locations of concealed equipment, services, and conduit.

.11 Maintenance materials and tools: Supply the following for Owner's use in maintenance of project.

.1 Lock cylinders: Ten for each master keyed group.

.2 Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.6 QUALITY ASSURANCE

.1 Standards for fire-rated doors: Maintain one copy of each referenced standard on site, for use by Consultant and Contractor.

.2 Installer qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

.3 Supplier qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

Part 2 Products

2.1 DESIGN AND PERFORMANCE CRITERIA

.1 Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

.2 Provide individual items of single type, of same model, and by same manufacturer.

.3 Provide door hardware products that comply with the following requirements:

.1 Applicable provisions of federal, provincial, and local codes.

.2 Fire-rated doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with CAN/ULC S104.

.3 Hardware on fire-rated doors: Listed and classified by ULC (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.

.4 Products requiring electrical connection: Listed and classified by ULC (DIR) as suitable for the purpose specified.

.4 Electrically operated or controlled hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with CSA C22.1.

.5 Lock function: Provide lock and latch function numbers and descriptions of manufacturer's series. Refer to Section 08 0671 for listing of hardware sets.

.6 Fasteners:

.1 Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.

.1 Aluminum fasteners are not permitted.

.2 Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

.2 Provide machine screws for attachment to reinforced hollow metal and aluminum frames.

.1 Self-drilling (Tek) type screws are not permitted.

.3 Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.

.4 Provide wall grip inserts for hollow wall construction.

.5 Provide spacers or sex bolts with sleeves for through bolting of hollow metal doors and frames.

.6 Fire-rated applications: Comply with NFPA 80.

.1 Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.

.2 Provide steel through bolts for attachment of surface mounted closers,

hinges, or exit devices to door panels unless proper door blocking is provided.

.7 Concealed Fasteners: Do not use through or sex bolt type fasteners on door panel sides indicated as concealed fastener locations, unless otherwise indicated.

2.2 KEY CONTROL SYSTEMS

.1 Key control systems: Comply with guidelines of BHMA A156.28.

.1 Provide keying information in compliance with DHI (KSN) standards.

.2 Keying: Grand master keyed.

.3 Include construction keying and control keying with removable core cylinders.

.4 Key to existing keying system.

.5 Supply keys in following quantities:

.1 1 each Grand Master keys.

.2 6 each Construction Master keys.

.3 15 each Construction keys.

.4 2 each Construction Control keys.

.5 2 each Control keys if new system.

2.3 FINISHES

.1 Finishes: Identified in Section 08 06 71 – Door Hardware Schedule.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on Shop Drawings.

.2 Verify that electric power is available to power operated devices and of correct characteristics.

3.2 INSTALLATION

.1 Install hardware in accordance with manufacturer's instructions and applicable codes.

.2 Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

.3 Use templates provided by hardware item manufacturer.

.4 Do not install surface mounted items until application of finishes to substrate are fully completed.

.5 Door hardware mounting heights: Distance from finished floor to centre line of hardware item. As indicated in following list, unless noted otherwise on Drawings.

.1 Mounting heights in compliance with CSA B651:

.1 Locksets: 1024 mm.

.2 Push plates/pull bars: 1067 mm.

.3 Deadlocks (Deadbolts): 1219 mm.

.4 Exit devices: 1024 mm.

.6 Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.3 SITE QUALITY CONTROL

.1 Perform site inspection and testing under provisions of Section 01 45 00 – Quality Control.

.2 Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been supplied and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

.1 Adjust hardware for smooth operation.

.2 Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.5 CLEANING

.1 Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

.2 Clean adjacent surfaces soiled by hardware installation.

.3 Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.6 PROTECTION

.1 Do not permit adjacent work to damage hardware or finish.

END OF SECTION

Legend:
Link to catalog cut sheet
Electrified Opening

Hardware Group No. 01

For use on Door #(s):
D100A
Ex Vestibule

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY TWP CON X DOOR HEIGHT			628	IVE
1	EA	ELEC PANIC HARDWARE	RX-24-V-EO-CON			626	FAL
1	EA	ELEC PANIC HARDWARE	RX-MEL-24-V-NL-OP-CON 24 VDC			626	FAL
1	EA	RIM CYLINDER	951 C-KWY			626	FAL
1	EA	90 DEG OFFSET PULL	8190EZHD 305MM O			630-316	IVE
1	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURFACE CLOSER	SC71A FA			689	FAL
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA			628	LCN
1	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)			630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH			ANCLR	LCN
1	EA	MOUNTING PLATE	SC70A-18PA			689	FAL
1	EA	SEALS AND THRESHOLD	BY CURTAIN WALL MFR.			628	
1	EA	WIRE HARNESS	CON-__P (SIZED TO SUIT)				SCH
1	EA	WIRE HARNESS	CON-6W				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28				BYO
1	EA	DOOR CONTACT	679-05HM			BLK	SCE
1	EA	POWER SUPPLY	PS902 900-4R KL900 120/240 VAC			LGR	SCE

THEORY OF OPERATION:
- EGRESS FREE AT ALL TIMES VIA PANIC OR ACTUATOR.
- PRESENTING VALID CREDENTIAL RETRACTS LATCH AND ENABLES O/S ACTUATOR.
- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLE
- RX SIGNALS AN AUTHORIZED PASSAGE.
- DOOR CONTACT SUPERVISES OPEN/CLOSED CONDITION.

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Hardware Group No. 02

For use on Door #(s):
D100B
In. Vestibule

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY X DOOR HEIGHT		628	IVE
1	EA	PUSH/PULL BAR	9190EZHD-305MM-NO		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	SC71A FA		689	FAL
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA	✓	628	LCN
1	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)	✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH		ANCLR	LCN
1	EA	MOUNTING PLATE	SC70A-18PA		689	FAL

THEORY OF OPERATION:
- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLE.

Hardware Group No. 03

For use on Door #(s):

D101	D106	D118	D123
Coat Check	Storage	Water	Ref

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
1	EA	WALL STOP	1277/1279TB		626	TRI

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Hardware Group No. 04

For use on Door #(s):

D102	D114
Arena	Arena

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY TWP CON X DOOR HEIGHT		✓	628	IVE
1	EA	ELEC PANIC HARDWARE	RX-24-V-EO-CON			626	FAL
1	EA	ELEC PANIC HARDWARE	RX-MEL-24-R-NL-OP-CON 24 VDC		✓	626	FAL
1	EA	RIM CYLINDER	951 C-KWY			626	FAL
1	EA	MORTISE CYLINDER	986 C-KWY X REQ. CAM.			626	FAL
2	EA	90 DEG OFFSET PULL	8190EZHD 305MM O			630-316	IVE
2	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURFACE CLOSER	SC71A FA			689	FAL
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA		✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)		✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH			ANCLR	LCN
1	EA	MOUNTING PLATE	SC70A-18PA			689	FAL
1	EA	SEALS AND THRESHOLD	BY CURTAIN WALL MFR.			628	
2	EA	WIRE HARNESS	CON-__P (SIZED TO SUIT)				SCH
2	EA	WIRE HARNESS	CON-6W		✓		SCH
1	EA	KEY SWITCH	653-1414 NS L2 12/24 VDC		✓	630	SCE
2	EA	DOOR CONTACT	679-05HM		✓	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-4R KL900 120/240 VAC		✓	LGR	SCE

THEORY OF OPERATION:
- EGRESS FREE AT ALL TIMES VIA PANIC OR ACTUATOR.
- KEY SWITCH ON/OFF/HOLD-OPEN ENABLES/DISABLES O/S ACTUATOR
- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLR
- RX SIGNALS AN AUTHORIZED PASSAGE.
- DOOR CONTACT SUPERVISES OPEN/CLOSED CONDITION.

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Hardware Group No. 05

For use on Door #(s):
D103
MPR

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	CLASSROOM LOCK	T561CP6 DAN		626	FAL
1	EA	WALL STOP	1277/1279TB		626	TRI
1	EA	GASKETING	188SBK PSA X 1/HEAD X 2/JAMBS		BK	ZER
1	EA	DOOR BOTTOM	355AA X REQ. WIDTH		AA	ZER

Hardware Group No. 06

For use on Door #(s):
D104

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	CLASSROOM LOCK	T561CP6 DAN		626	FAL
1	EA	WALL STOP	1277/1279TB		626	TRI

Hardware Group No. 07 Rated

For use on Door #(s):

D105A	D105B
Janitor	Janitor

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
1	EA	SURFACE CLOSER	SC71A DEL REG		689	FAL
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	WALL STOP	1277/1279TB		626	TRI
1	EA	GASKETING	188SBK PSA X 1/HEAD X 2/JAMBS		BK	ZER
1	EA	DOOR BOTTOM	355AA X REQ. WIDTH		AA	ZER

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Hardware Group No. 08

For use on Door #(s):
D107
Corridor

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 114X102MM			652	IVE
1	EA	PUSH PLATE	8200 150X405MM			630	IVE
1	EA	PULL PLATE	8303 255MM 100X405MM			630	IVE
1	EA	SURF. AUTO OPERATOR	9531IQ COV RSA		✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)		✓	630	LCN
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS			630	IVE
1	EA	WALL STOP	1277/1279TB			626	TRI

THEORY OF OPERATION:

- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLE.

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Hardware Group No. 09

For use on Door #(s):
D108
UTR

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
1	EA	ELECTRIC STRIKE	6400 FS 12/24 VAC/VDC	✓	630	VON
1	EA	SURF. AUTO OPERATOR	9531IQ COV RSA	✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)	✓	630	LCN
1	EA	PUSH TO LOCK FULL LENGTH	CM-7536VR/8B	✓	628	CAM
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	WALL STOP	1277/1279TB		626	TRI
1	EA	DOOR CONTACT	679-05HM	✓	BLK	SCE
1	EA	EMERGENCY CALL KIT	CX-WEC10K2	✓	630	CAM
1	EA	LED OCCUPIED INDICATOR	CM-AF500	✓		CAM
1	EA	ADVANCED LOGIC RELAY	CX-33	✓		CAM

THEORY OF OPERATION:
- ELECTRIC STRIKE NORMALLY UNLOCKED.
- PRESSING ACTUATOR INITIATES OPERATOR CYCLE.
- PRESSING PUSH TO LOCK BUTTON LOCKS ELECTRIC STRIKE AND DISABLES O/S ACTUATOR.
- OPENING DOOR RESETS TO NORMAL STATUS,
- DOOR CONTACT SUPERVISES OPEN/CLOSED CONDITION.

Hardware Group No. 10

For use on Door #(s):

D109	D110	D111	D112	D113
W/C	W/C	W/C	W/C	W/C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	PRIVACY LOCK	T301S DAN		626	FAL
1	EA	WALL BMPR CAST CONCAVE SC	1270-CV		626	TRM

Hardware Group No. 11

For use on Door #(s):
D115A
Ex. Vestibule

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY TWP CON X DOOR HEIGHT		✓	628	IVE
1	EA	ELEC PANIC HARDWARE	RX-MEL-24-R-NL-OP-CON 24 VDC		✓	626	FAL
1	EA	MORTISE CYLINDER	986 C-KWY X REQ. CAM.			626	FAL
1	EA	90 DEG OFFSET PULL	8190EZHD 305MM O			630-316	IVE
1	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA		✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)		✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH			ANCLR	LCN
1	EA	SEALS AND THRESHOLD	BY CURTAIN WALL MFR.			628	
1	EA	WIRE HARNESS	CON-__P (SIZED TO SUIT)				SCH
1	EA	WIRE HARNESS	CON-6W		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28				BYO
1	EA	DOOR CONTACT	679-05HM		✓	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-4R KL900 120/240 VAC		✓	LGR	SCE

THEORY OF OPERATION:
- EGRESS FREE AT ALL TIMES VIA PANIC OR ACTUATOR.
- PRESENTING VALID CREDENTIAL RETRACTS LATCH AND ENABLES O/S ACTUATOR.
- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLE
- RX SIGNALS AN AUTHORIZED PASSAGE.
- DOOR CONTACT SUPERVISES OPEN/CLOSED CONDITION.

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Hardware Group No. 12

For use on Door #(s):
D115B
In. Vestibule

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY X DOOR HEIGHT		628	IVE
1	EA	PUSH/PULL BAR	9190EZHD-305MM-NO		630-316	IVE
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA	✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)	✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH		ANCLR	LCN
1	EA	WALL STOP	1277/1279TB		626	TRI

THEORY OF OPERATION:
- PRESSING ON ACTUATOR RETRACTS LATCH AND INITIATES OPERATOR CYCLE.

Hardware Group No. 13

For use on Door #(s):

D116	D119	D120	D121	D122
Locker Rm	Locker Rm	Locker Rm	Locker Rm	Locker Rm

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	700CS X REQ. HEIGHT	US32DAN	IVE
1	EA	CYL X TURN DEAD LOCK	L460L 09-509	626	SCH
1	EA	CLASSROOM MORTISE CYL TURN	09-905 118 36-083	626	SCH
1	EA	LOCKER ROOM PADLOCK ENCLOSER	LMT-PCTP	630	
1	EA	PUSH PLATE	8200 150X405MM	630	IVE
1	EA	PULL PLATE	8303 255MM 100X405MM	630	IVE
1	EA	SURFACE CLOSER	SC71A FA	689	FAL
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS	630	IVE
1	EA	WALL STOP	1277/1279TB	626	TRI

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Hardware Group No. 14

For use on Door #(s):
D117
Jr Storage

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM NRP		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
1	EA	SURFACE CLOSER	SC71A DEL SS		689	FAL
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	GASKETING	188SBK PSA X 1/HEAD X 2/JAMBS		BK	ZER
1	EA	DOOR BOTTOM	355AA X REQ. WIDTH		AA	ZER

Hardware Group No. 15

For use on Door #(s):
D130
Electrical Rm

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
1	EA	SURFACE CLOSER	SC71A REG		689	FAL
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	WALL STOP	1277/1279TB		626	TRI
1	EA	GASKETING	188SBK PSA X 1/HEAD X 2/JAMBS		BK	ZER
1	EA	DOOR BOTTOM	355AA X REQ. WIDTH		AA	ZER

Hardware Group No. 16

For use on Door #(s):
EX131
Ex Vestibule Existing Door

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1SC 114MM NRP		630	IVE
1	EA	PANIC HARDWARE	2227-DT		689	VON
1	EA	PANIC HARDWARE	2227-NL		689	VON
1	EA	MONITOR STRIKE	4263-T1 24 VDC	✓	626	VON
1	EA	RIM CYLINDER	951 C-KWY		626	FAL
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA	✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)	✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH		ANCLR	LCN
1	EA	NOTE	EXISTING HARDWARE TO REMAIN			UNK

CENTER MULLION TO BE REMOVED
A 90S OH STOP OR WALL/FLOOR STOP MIGHT BE REQUIRED.

THEORY OF OPERATION:
- FREE EGRESS AT ALL TIME VIA PANIC DEVICE.
- WHEN DEVICE IS DOGGED, BOTH ACTUATORS ARE ENABLED.
- MONITOR STRIKE MONITORS EXTENDED/RETRACTED CONDITION OF TOP LATCH.
- PRESSING ON EITHER ACTUATOR INITIATES OPERATOR CYCLE.

Hardware Group No. 17

For use on Door #(s):
D131B
In Vestibule

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 127X114MM		652	IVE
1	EA	PUSH PLATE	8200 150X405MM		630	IVE
1	EA	PULL PLATE	8303 255MM 100X405MM		630	IVE
1	EA	SURF. AUTO OPERATOR	9542IQ COV RSA	✓	628	LCN
2	EA	ACTUATOR (36" COLLUMN)	8310-836T (FULL LENGTH)	✓	630	LCN
1	EA	MOUNTING PLATE	9540IQ-18 X REQ. WIDTH		ANCLR	LCN
1	EA	KICK PLATE	8400 255MM X REQ. WIDTH B-CS		630	IVE
1	EA	WALL STOP	1277/1279TB		626	TRI

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Hardware Group No. 18 Rated

For use on Door #(s):
D200
Mechanical Attic

Provide each PR of doors with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1 114X102MM		652	IVE
1	EA	STOREROOM LOCK	T581CP6 DAN		626	FAL
2	EA	SURFACE CLOSER	SC71A DEL REG		689	FAL
1	EA	GASKETING	188SBK PSA X 1/HEAD X 2/JAMBS		BK	ZER
2	EA	DOOR BOTTOM	355AA X REQ. WIDTH		AA	ZER

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Part 1 General

1.1 SECTION INCLUDES

.1 Insulating glass units.

.2 Glazing units.

.3 Plastic films.

.4 Glazing compounds and accessories.

1.2 RELATED REQUIREMENTS

.1 Section 06 40 00 – Architectural Woodwork.

.2 Section 07 25 00 – Weather Barriers.

.3 Section 07 92 00 – Joint Sealants

.4 Section 08 11 13 – Hollow Metal Doors and Frames.

.5 Section 08 43 13 – Aluminium-Framed Storefronts.

.6 Section 08 54 13 – Fibreglass Windows

1.3 REFERENCE STANDARDS

.1 16 CFR 1201 - Safety Standard for Architectural Glazing Materials current edition.

.2 ANSI 97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015.

.3 ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2015).

.4 ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

.5 ASTM C1036 - Standard Specification for Flat Glass 2016.

.6 ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2012.

.7 ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

.8 ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2015.

.9 ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.

.10 CAN/CGSB 12.1 - Safety Glazing 2017.

.11 CAN/CGSB 12.3 - Flat, Clear Float Glass 1991 (R2017).

.12 CAN/CGSB 12.20 - Structural Design of Glass for Buildings 1989.

.13 CAN/CGSB 19.13 - Sealing Compound, One Component, Elastomeric, Chemical Curing 1987.

.14 GANA (GM) - GANA Glazing Manual 2008.

.15 GANA (SM) - GANA Sealant Manual 2008.

.16 IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial Residential Use 1990 (2016).

.17 ITS (DIR) - Intertek Testing Services, Directory of Listed Products current edition.

.18 LBNL WINDOW - Lawrence Berkeley National Laboratory WINDOW 8.

.19 NBC - National Building Code of Canada 2020.

.20 NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

.21 NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2014, with Errata (2017).

.22 NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.

.23 ULC (DIR) - Online Certifications Directory (Canada) Current Edition.

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data on insulating glass units, glazing unit, and plastic film: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

.3 Product data on glazing compounds and accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colours.

.4 Samples: Submit two samples 300 by 300 mm in size of IGUs, spandrel glass, and butt-glazed monolithic glass with joint in centre of sample.

.5 Certificate: Certify that products of this section meet or exceed specified requirements.

.6 Manufacturer's qualification Statement.

.7 Installer's qualification statement.

.8 Warranty documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

.1 Perform work in accordance with GANA (GM), GANA (SM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.

.2 Manufacturer qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

.3 Installer qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

.4 Quality limitations for heat strengthened and tempered glass: Perform tempering or heat strengthening in accordance with CAN/CGSB 12.1 and as follows:

.1 Fabricate glass using horizontal roller heating process only, with roller wave distortion parallel to bottom edge of glass as when installed.

.2 Maximum deviation from flatness at any peak (peak to valley deviation), 0.08 mm at centre of lite and 0.20 mm within 267 mm of leading or trailing edge.

.3 Apply heat treatment prior to the application of low-e coatings to minimize appearance of roller wave distortion.

1.6 SITE CONDITIONS

.1 Ambient conditions: Maintain temperature, humidity and solar exposure conditions of glass glazing materials during shipping, storage and site installation as required by manufacturer to maintain warranty and performance of installed products, and as follows:

.1 Install glazing when ambient temperature is above manufacturer's written minimum requirement and rising.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.7 WARRANTY

.1 See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

.2 Insulating glass units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

Part 3 Products

2.1 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

.1 Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.

.1 Comply with CAN/CGSB 12.20 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.

.2 Ultimate limit states: Positive and negative pressure acting normal to plane of glass using wind load requirements of Section 4.1.7 of the National Building Code NBC for Normal Importance Category using Importance Factor (Iw) accounting for normal windload and gust velocities.

.3 Reference velocity pressure: Velocity pressure (q) located in National Building Code (NBC) Structural Commentaries, Wind Load and Effects, (Part 4 of Division B), based on probability of being exceeded in any one year of 1 in 50.

.4 Occupant safety (glass acting as guards): Design glass minimum lateral design loads of 0.5 kPa for all glass installed in walls, partitions or barriers having a 600 mm or higher elevation from adjacent slabs or grade; glass acting as guards criteria govern where minimum normal windload pressure (non gust) is lower than required loads for occupant safety in accordance with Section 4.1.5 of the National Building Code NBC with Manitoba amendments.

.5 Limit centre of glass deflection to a maximum of 1/60 and not exceeding 19 mm relative to the undeflected glass plane.

.6 Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load and as required to maintain full contact with glazing throat.

.7 Glass thicknesses listed are minimum.

.8 Multipliers: Modify glass thicknesses based on substituting heat treated or laminated glass configurations as required to obtain the most economical glass assembly.

.9 Confirm glass thicknesses by analyzing project loads and in-service conditions and provide glass in strengths (annealed or heat treated) and actual thickness required to meet deflection criteria.

.2 Air/vapour barrier and air barrier seals: Provide completed assemblies that maintain continuity of building enclosure air/vapour barrier and air barrier.

.1 In conjunction with air/vapour barrier and joint sealer materials described in other sections.

.1 See Section 07 25 00.

.2 To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapour retarder and air barrier seal.

.3 To maintain a continuous air/vapour barrier and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

.3 Thermal and optical performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:

.1 Centre of glass U-value: Comply with NFRC 100 using LBNL WINDOW computer program.

.2 Centre of glass solar heat gain coefficient (SHGC): Comply with NFRC 200 using LBNL WINDOW computer program.

.3 Solar optical properties: Comply with NFRC 300 test method.

2.2 GLASS MATERIALS

.1 Float glass: Provide float glass based glazing unless noted otherwise.

.1 Annealed type: CAN/CGSB 12.3, Ultra-Clear (Low-Iron)

.1 Quality: Glazing with specific defect limitations as defined by Table 3 of CAN/CGSB 12.3 based on area of glass units.

.2 Clear safety glass: Heat treated glass manufactured in compliance with

CAN/CGSB 12.1 and as follows:

.1 Classification: Type 1 - Transparent Flat Glass, Class 1 - Clear, Quality Q3 - Architectural Glass in accordance with ASTM C1036.

.2 Kind: FT - Fully Tempered in compliance with ASTM C1048.

.3 Exposed edges: Ground with no chips, cracks or flaws, with sharp corners and edges eased and polished before heat treatment.

.4 Labelling: Required.

.3 Impact resistant safety glass: Complies with CAN/CGSB 12.1 criteria; Type 1Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.3 INSULATING GLASS UNITS

.1 Insulating glass units: Types as indicated.

.1 Durability: Certified by an independent testing agency to comply with ASTM E2190.

.2 Coated glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapour deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV.

.3 Warm-edge spacers: Flexible silicone with polyisobutylene (PIB) primary seal.

.1 Spacer width: As required for specified insulating glass unit.

.2 Spacer height: 6.85 mm.

.3 Manufacturers:

.1 Quanex IG Systems, Inc; Super Spacer Triseal.

.4 Spacer colour: Black.

.4 Edge seal:

.1 Dual-sealed system: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.

.2 Colour: Black.

.5 Purge interpane space with dry air, hermetically sealed.

.2 Type 1 (IGU-1): Vision glass, triple glazed.

.1 Applications: Exterior glazing unless otherwise indicated.

.2 Space between lites filled with argon.

.3 Outboard lite: Fully tempered float glass, 6 mm thick, minimum.

.1 Tint: Ultra-Clear (low-iron).

.2 Coating: Low-E (passive type), on #2 surface.

.4 Middle lite: Heat-strengthened float glass, 6 mm thick, minimum.

.1 Tint: Ultra-Clear (low-iron).

.5 Inboard lite: Heat-strengthened float glass, 6 mm thick, minimum.

.1 Tint: Ultra-Clear (low-iron).

.2 Coating: Low-E (passive type) on #2 surface

.6 Total thickness: 43 mm.

.7 Thermal transmittance (USI Factor), Winter - Center of Glass: 1.04 Watts per square metre per degree Kelvin, nominal.

.8 Visible light transmittance (VLT): 0.55

.9 U-Factor: 0.97

.10 Solar heat gain coefficient (SHGC): 0.45, nominal.

.11 Visible light reflectance, Outside: 43 percent, nominal.

.12 Glazing method: Wet/dry, pressure glazed to meet performance criteria.

.3 Type 2 (IGU-2): Safety glazing. Double unit.

.1 Applications:

.1 Glazed lites in exterior doors.

.2 Glazed sidelights and panels next to doors.

.3 Other locations required by applicable federal, provincial, and municipal codes and regulations.

.2 Space between lites filled with argon.

.3 Glass type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.

.4 Tint: Ultra-Clear (low-iron).

.5 Total thickness: 25 mm.

.6 Glazing method: Dry glazing method, gasket glazing.

.4 Type 3 (IGU-3): Monolithic Vision Glazing:

.1 Double pane

.2 8mm thick, fully tempered

.3 Space between lites filled with argon

.4 Tint: Ultra-Clear (low-iron)

.5 Total thickness: 28.5mm

.6 Max width: 1524mm (5’)

.7 Structural silicon joint between glazing units.

2.4 GLAZING UNITS

.1 GU-2 Display case doors and glass shelves:

.1 Applications: Locations as indicated on Drawings.

.2 Tint: Clear.

.3 Glass type: Fully tempered float glass with ground edges and corners; ASTM C1048.

.4 Thickness:

.1 Doors: 6mm, nominal

.2 Shelves: 10mm, nominal

2.5 GLAZING COMPOUNDS

.1 Silicone sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining, conforming to CAN/CGSB 19.13; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; colour as selected.

2.6 ACCESSORIES

.1 Setting blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 25 mm for each square metre of glazing or minimum 100 mm by width of glazing rabbet space minus 1.5 mm by height to suit glazing method and pane weight and area.

.2 Spacer shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

.3 Glazing tape, back bedding mastic type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black colour.

.1 Width: As required for application.

.2 Thickness: As required for application.

.4 Glazing gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; colour black.

2.8 FABRICATION

.1 Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

.2 Provide stepped (offset) insulating glazing units where indicated. Provide factory-applied UV-resistant buttered fill at corners.

Part 3 Execution

3.1 VERIFICATION OF CONDITIONS

.1 Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

.2 Verify that the minimum required face and edge clearances are being provided.

.3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

.4 Verify that sealing between joints of glass framing members has been completed effectively.

.5 Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.3 INSTALLATION, GENERAL

.1 Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

.2 Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

.3 Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

.4 Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

.5 Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

.6 Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.1 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

.1 Application - Exterior or interior glazed: Set glazing infills from either the exterior or the interior of the building.

.2 Place setting blocks at 1/4 points with edge block no more than 150 mm from corners.

.3 Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

.4 Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.2 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)

.1 Application - Interior glazed: Set glazing infills from the interior of the building.

.2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 points with edge block no more than 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

.5 Place glazing tape on free perimeter of glazing in same manner described above.

.6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.7 Carefully trim protruding tape with knife.

3.3 INSTALLATION - BUTT JOINT GLAZING METHOD (SEALANT ONLY)

.1 Temporarily brace glass in position for duration of glazing process; mask edges of glass at adjoining glass edges and between glass edges and framing members.

.2 Temporarily secure a small diameter non-adhering foamed rod on back side of joint.

.3 Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod, and then tool sealant surface smooth to concave profile.

.4 Permit sealant to cure then remove foam backer rod, and then apply sealant to opposite side, tool smooth to concave profile.

.5 Remove masking tape.

3.4 INSTALLATION - WET/DRY PRESSURE GLAZED SYSTEMS

.1 Application - Exterior glazed: Set glazing infills from exterior side of building.

.2 Apply heel bead of silicone sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapour seal.

.3 Place setting blocks at 1/4 points with edge block no more than 150 mm from corners.

.4 Rest glazing on setting blocks and push against gasket attached to fixed stop with sufficient pressure on gasket to attain full contact.

.5 Install pressure plates without displacing glazing gasket; exert pressure for full continuous contact.

.6 Apply cap bead of silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

.7 Install cover plate.

3.5 INSTALLATION - STRUCTURAL SILICONE GLAZING

.1 Application - Site Glazed: Follow basic guidelines of structural silicone glazing for glazing application.

.1 Two-sided structural: Glass structurally adhered to vertical mullions at exterior corners indicated, with horizontal sides captured in glazing pockets.

.2 Provide design review of the glazing system and project details, adhesion testing, proper surface preparation, training and a quality service program.

.3 Provide only structural silicone sealant, tested and manufactured for structural glazing.

3.6 INSTALLATION - PLASTIC FILM

.1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

.2 Place without air bubbles, creases or visible distortion.

3.7 CLEANING

.1 Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

.2 Remove non-permanent labels immediately after glazing installation is complete.

.3 Clean glass and adjacent surfaces after sealants are fully cured.

.4 Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Performance in accordance with glass manufacturer's written recommendations.

3.8 PROTECTION

.1 After installation, mark pane with an ‘X’ using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

.2 Remove and replace glass that is damaged during construction period prior to Date of Substantial Performance.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Performance criteria for gypsum board assemblies.

.2 Acoustic insulation.

.3 Gypsum sheathing.

.4 Cementitious backing board.

.5 Gypsum board.

.6 Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

.1 Section 09 22 16 - Non-Structural Metal Framing.

1.3 REFERENCE STANDARDS

.1 ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2010 (Reaffirmed 2016).

.2 ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units 1999 (Reaffirmed 2016).

.3 ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2015.

.4 ASTM C834 - Standard Specification for Latex Sealants 2017.

.5 ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2018.

.6 ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2015.

.7 ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2016.

.8 ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base 2014a.

.9 ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2013.

.10 ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing 2013a.

.11 ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units 2017a.

.12 ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

.13 ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels 2018.

.14 ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.

.15 ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

.16 ASTM E413 - Classification for Rating Sound Insulation 2016.

.17 ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2014.

.18 CAN/ULC S102 - Method of Testing for Surface Burning Characteristics of Building Materials and Assemblies 2018.

.19 CAN/ULC S114 - Test for Determination of Non Combustibility in Building Materials 2018.

.20 GA-216 - Application and Finishing of Gypsum Panel Products 2016.

.21 ULC (FRD) - Fire Resistance Directory Current Edition.

1.1 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide data on gypsum board, accessories, and joint finishing system.

.3 Installer qualification statement.

1.2 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing gypsum board installation and finishing, with minimum five years of experience.

Part 2 Products

2.1 GYPSUM BOARD ASSEMBLIES

.1 Provide completed assemblies complying with ASTM C840 and GA-216.

.1 Fire-rated assemblies: Provide completed assemblies complying with applicable code.

.1 ULC Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current ULC (FRD).

2.2 BOARD MATERIALS

.1 Gypsum board: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

.1 Application: Use for vertical surfaces, unless otherwise indicated.

.2 Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper- faced board.

.3 Mould-resistance: Score of 10, when tested in accordance with ASTM D3273.

.1 Mould- and moisture-resistant board is required whenever board is being installed before the building is enclosed and conditioned.

.2 Mould- and moisture-resistant board is required where indicated on the Drawings as "moisture-resistant".

.4 At assemblies indicated with fire-rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type board, ULC listed.

.5 Thickness:

.1 Vertical surfaces: 16 mm.

.6 Glass-mat faced mould- and moisture-resistant products:

.1 USG/CGC; Sheetrock Brand Glass-Mat Panels Mold Tough.

.2 Georgia Pacific; DensArmor Plus Interior Panel.

.3 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

.2 Cement board:

.1 Application: Surfaces behind thinset tile in steel stud framed partitions with plumbing fixtures.

.2 Mould resistance: Score of 10, when tested in accordance with ASTM D3273.

.3 ANSI cement-based board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.

.1 Thickness: 12.7 mm.

.2 Products:

.1 CGC; Durock Brand Cement Board with Edgeguard.

.2 National Gypsum; Permabase Cement Board.

.3 C-Cure Board 990.

.3 Backing board for non-wet areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.

.1 Application: Vertical surfaces behind thinset tile, except partitions with plumbing fixtures.

.2 Edges: Tapered.

.4 Ceiling board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

.1 Application: Ceilings, unless otherwise indicated.

.2 Thickness: 19 mm.

.3 Edges: Tapered.

.5 Exterior sheathing board: Sizes to minimize joints in place; ends square cut.

.1 Application: Exterior sheathing, unless otherwise indicated.

.2 Glass mat faced sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M

.3 Edges: Square.

.4 Glass mat faced products:

.1 CertainTeed; GlasRoc Sheathing.

.2 Georgia Pacific; DensGlass Sheathing.

.3 USG/CGC; Securock Glass-Mat Sheathing.

.4 Cabot; Blueglass Sheathing.

.5 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

2.3 ACCESSORIES

.1 Acoustic insulation for non-rated assemblies: Meeting the requirements of CAN/ULC S702.1, ASTM E90; glass fibre acoustic sound batts, Type 1 for all properties other than thermal, width to friction fit steel studs; unfaced. Thickness to fill a minimum of 90 of the cavity width, nominal density 12.2 kg/m³ minimum; STC ratings as indicated on Drawings.

.1 Products:

.1 Owens Corning; EcoTouch Quiet one.

.2 Johns Manville; Sound-Shield.

.2 Acoustic insulation for fire- and smoke-rated assemblies: Meeting the requirements of CAN/ULC S702.1, mineral fibre acoustic sound batts, Type 1 for all properties except thermal performance, width to friction fit steel studs; unfaced. Thickness to fill a minimum of 90% of the cavity width, nominal density 40 kg/m³ minimum; STC ratings as indicated on Drawings; having maximum flame spread and smoke developed of 0/0 in accordance with CAN/ULC S102 and being non-combustible in accordance with CAN/ULC S114.

.1 Products:

.1 Thermafiber; SAFB.

.2 Rockwool; AFB.

.3 Johns Manville; Mineral Wool Sound Attenuation Fire Batts (SAFB).

.3 Acoustic sealants for fire-rated assemblies: Use only fire rated materials as final seal in fire-rated assemblies; apply acoustic sealants prior application of fire seals; provide materials specified in Section 07 84 00.

.4 Acoustic sealants for smoke-rated assemblies: Lightweight low trigger resistance, non-sag, smooth surface finishing smoke and acoustic sealant in accordance with ASTM C834.

.5 Acoustic sealant for exposed joints: Lightweight low trigger resistance, non-sag, paintable, non-staining, latex sealant in accordance with ASTM C834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction.

.1 Products:

.1 Tremco; Tremflex 834.

.2 Master Builders; MasterSeal NP520.

.3 Pecora AC-20 Silicone.

.6 Acoustic sealant for concealed joints: Lightweight low trigger resistance, non-drying,

non-hardening, non-skinning, non-staining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

.1 Products:

.1 Tremco; Acoustical Curtain Wall Sealant.

.7 Finishing accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.

.1 Types: As detailed or required for finished appearance.

.2 Special shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

.8 Joint materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

.1 Tape: 50 mm wide, coated fibreglass tape for joints and corners, except as otherwise indicated.

.2 Chemical hardening type compound.

.9 High build drywall surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish, and for finishing interior glass-mat faced gypsum board scheduled for Level 4 finish.

.10 Screws for fastening of gypsum panel products to cold-formed steel studs less than 0.84 mm in thickness and wood members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

.11 Screws for fastening of gypsum panel products to steel members from 0.84 to 2.84 mm in thickness: ASTM C954; steel drill screws, corrosion resistant.

Part 3 Examination

3.1 EXAMINATION

.1 Verify that project conditions are appropriate for work of this section to commence.

3.2 ACOUSTIC ACCESSORIES INSTALLATION

.1 Acoustic insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

.2 Acoustic sealant: Install in accordance with manufacturer's instructions.

.1 Place continuous bead at perimeter of each layer of gypsum board.

.2 Seal around all penetrations by conduit, pipe, ducts, rough-in boxes, and other penetrations, except where firestopping is provided.

3.3 BOARD INSTALLATION

.1 Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize

butt end joints, especially in highly visible locations.

.2 Single-layer non-rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

.1 Exception: Tapered edges to receive joint treatment at right angles to framing.

.3 Double-layer non-rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

.4 Fire-rated construction: Install gypsum board in strict compliance with requirements of assembly listing.

.5 Exposed gypsum board in interior wet areas: Seal joints, cut edges, and holes with water- resistant sealant.

.6 Exterior sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.

.7 Seal joints, cut edges, and holes with water-resistant sealant.

.8 Cementitious backing board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

.9 Installation on metal framing: Use screws for attachment of gypsum board.

3.4 INSTALLATION OF TRIM AND ACCESSORIES

.1 Control joints: Place control joints consistent with lines of building spaces and in accordance with ASTM C840.

.2 Corner beads: Install at external corners, using longest practical lengths.

.3 Edge trim: Install at locations where gypsum board abuts dissimilar materials.

3.5 JOINT TREATMENT

.1 Glass mat faced gypsum board: Use fibreglass joint tape, bedded and finished with chemical hardening type joint compound.

.2 Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

.1 Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

.2 Level 3: Walls to receive textured wall finish.

.3 Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.

.4 Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

.5 Level 0: Temporary partitions, and surfaces indicated to be finished in later stage of project.

.3 Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

.1 Feather coats of joint compound so that camber is maximum 0.8 mm.

.2 Taping, filling and sanding is not required at base layer of double layer applications.

.4 Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.6 TOLERANCES

.1 Maximum variation of finished gypsum board surface from true flatness: 3 mm in 3 m in any direction.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Metal partition, ceiling, and soffit framing.

.2 Framing accessories.

1.2 REFERENCE STANDARDS

.1 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2018.

.2 ASTM C645 - Standard Specification for Non-structural Steel Framing Members 2014, with Editorial Revision (2015).

.3 ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2017.

.4 ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2016.

.5 CSSBI S18 - Guide Specification for Non-loadbearing Steel Framing Current Edition.

.6 SSPC-Paint 20 -Z inc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

1.3 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Indicate component details, stud layout, framed openings, anchorage to structure, acoustic details, accessories, and items of other related work.

.2 Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.

.3 Product data: Provide data describing framing member materials and finish, product criteria, load charts, limitations, and partition head to structure connectors.

.4 Installer's qualification statement.

1.4 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

Part 2 Products

2.1 FRAMING MATERIALS

.1 Fire-rated assemblies: Comply with applicable code and as indicated on Drawings.

.2 Non-loadbearing framing system components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and CSSBI S18 for the spacing indicated, with maximum deflection of wall framing of L/240 at 360 Pa for

standard assemblies up to 3.6 m high, L/240 at 360 Pa for tall assemblies greater than 3.6 m high to a maximum of 3.6 m high, and L/240 at 480 Pa for assemblies greater than 4.8 m high.

.1 Studs: C shaped with flat or formed webs with knurled faces.

.2 Runners: U shaped, sized to match studs.

.3 Ceiling channels: C shaped.

.4 Furring: Hat-shaped sections, minimum depth of 22 mm.

.3 Ceiling hangers: Type and size as specified in ASTM C754 for spacing required.

.4 Partition head to structure connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.

.1 Structural performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with 1.

.2 Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60/ 180 hot dipped galvanized coating.

.5 Deflection and firestop track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.

.6 Tracks and runners: Same material and thickness as studs, bent leg retainer notched to receive studs.

.7 Furring and bracing members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.

.8 Fasteners: ASTM C1002 self-piercing tapping screws.

.9 Anchorage devices: Powder actuated.

.10 Touch-up primer for galvanized surfaces: SSPC-Paint 20 Type I - Inorganic.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify that rough-in utilities are in proper location.

3.2 INSTALLATION OF STUD FRAMING

.1 Comply with requirements of ASTM C754.

.2 Extend partition framing to structure where indicated and to ceiling in other locations.

.3 Partitions terminating at ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

.4 Partitions terminating at structure: Attach top runner to structure, maintain

clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

.5 Align and secure top and bottom runners at 600 mm on centre.

.6 Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

.7 Install studs vertically at spacing indicated on Drawings.

.8 Align stud web openings horizontally.

.9 Secure studs to tracks using welding, crimping or fastener method.

.10 Stud splicing is not permissible.

.11 Fabricate corners using a minimum of three studs.

.12 Double stud at wall openings, door and window jambs, not more than 50 mm from each side of openings.

.13 Brace stud framing system rigid.

.14 Coordinate erection of studs with requirements of door frames and borrowed light frames; install supports and attachments.

.15 Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.

.16 Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware.

.17 Furring: Coordinate with sound isolation clip spacing and locations. Lap splices a minimum of 150 mm.

3.3 CEILING AND SOFFIT FRAMING

.1 Comply with requirements of ASTM C754.

.2 Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

.3 Install furring independent of walls, columns, and above-ceiling work.

.4 Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits., and interior ceilings where indicated.

.5 Space main carrying channels at maximum 1 800 mm on centre, and not more than 150 mm from wall surfaces. Lap splice securely.

.6 Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

.7 Place furring channels perpendicular to carrying channels, not more than 50 mm from perimeter walls, and rigidly secure. Lap splices securely.

.8 Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 600 mm past each opening.

.9 Laterally brace suspension system.

3.4 TOLERANCES

.1 Maximum variation from true position: 3 mm in 3 m.

.2 Maximum variation from plumb: 3 mm in 3 m.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Tile for wall applications.

.2 Non-ceramic trim.

.3 Installation of full body porcelain tile tactile warning indicators

1.2 RELATED REQUIREMENTS

.1 Section 09 75 00 - Stone Facing: Interior stone

.2 Section 10 14 75 - Tactile Warning Indicators: Supply of full body porcelain tile tactile warning indicators

1.3 DEFINITIONS

.1 Large Format Tile: Tile larger than 380 mm in one or more directions.

1.4 REFERENCE STANDARDS

.1 ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2014.

.2 ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2010 (Reaffirmed 2016).

.3 ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2010).

.4 ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium). 2017.

.5 ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2013 (Revised).

.6 ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2012 (Revised).

.7 ANSI A118.11 - American National Standard Specifications for EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2010).

.8 ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar 2012.

.9 ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

.10 ISO 13007-1 - Ceramic tiles -- Grouts and adhesives -- Part 1: Terms, definitions and specifications for adhesives 2014.

.11 TTMAC (IM) - Tile Installer Technical Handbook 2018/2019.

1.1 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

.3 Shop Drawings: Indicate tile layout, patterns, colour arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, and setting details.

.4 Samples: Mount tile and apply grout on two plywood panels, minimum 900 450 by 900 mm in size illustrating pattern, colour variations, and grout joint size variations.

.5 Master grade certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.

.6 Installer's qualification statement.

.7 Maintenance data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

.8 Maintenance Supply the following for Owner's use in maintenance of project.

.9 See Section 01 60 00 – Product Requirements for additional provisions.

.10 Extra tile: 2 percent of each size, colour, and surface finish combination.

1.6 QUALITY ASSURANCE

.1 Maintain one copy of ANSI A108/A118/A136 installation standards and TTMAC (IM) on site.

.2 Installer qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.7 MOCK-UPS

.1 See Section 01 40 00 - Quality Requirements for additional requirements.

.2 Construct tile mock-up where indicated on Drawings, incorporating all components specified for the location.

.1 Minimum size of mock-up is indicated on Drawings.

.2 Approved mock-up may remain as part of the Work.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.9 SITE CONDITIONS

.1 Maintain ambient and substrate temperature no lower than 10 degrees C during installation of mortar materials.

Part 2 Products

2.1 WALL TILE

.1 Refer to Room Finish Schedule and Floor Finish Plan on Architectural Drawings

for locations.

.2 Acceptable Manufacturers:

.1 Olympia Tile. Metropolis Series

.3 Size: 75 x 300mm

.4 Allow for 3 colours from full range

.5 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.2 FLOOR TILE

.1 Refer to Room Finish Schedule and Floor Finish Plan on Architectural Drawings for locations.

.2 Acceptable Manufacturers:

.1 For Shower Floor: Olympia Tile. Ontario Series

.3 Size: 75 x 75 mm (2”x2”) Square

.4 Allow for 2 colours from full range.

.5 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.2 TRIM AND ACCESSORIES

.1 Non-ceramic trim: Material and finish as indicated in Section 09 06 10 - Material Schedule, style and dimensions to suit application, for setting using tile mortar or adhesive.

.1 Applications:

.1 Open edges of wall tile.

.2 Open edges of floor tile.

.3 Transition between floor finishes of different heights.

.2 Manufacturers:

.1 Schluter.

.2 Profilitec.

.3 Blanke.

.4 Substitutions: See Section 01 25 13 – Product Substitution Procedures.

2.3 SETTING MATERIALS

.1 Mortar Type 1 - Modified non-sagging dry-set lightweight cement mortar complying with ANSI A118.4, ANSI A118.11, and ISO 13007-1 C2TES1P1.

.1 Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.

.2 Products:

.1 Mapei; Ultralite.

.2 Custom Building Products: Versabond.

.3 Flextile; 66 Flexlite Mortar.

.4 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

.2 Mortar Type 2 - Improved latex-Portland cement mortar bond coat: Polymer-modified, non-sagging, dry-set cement mortar for use with large and heavy tile, complying with ANSI A118.4, ANSI A118.11, ANSI A118.15, and ISO 13007-1 C2TES1P1.

.1 Applications: Use this type of bond coat where indicated for large format heavy tile, and porcelain tile tactile warning indicators.

.2 Products:

.1 Mapei; Ultraflex LFT.

.2 Custom Building Products: Versabond LFT.

.3 Flextile; 56SR Mortar.

.4 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

2.4 GROUTS

.1 Grout Type 1 - Epoxy grout: ANSI A118.3 and ISO 13007-1 RG, chemical- and stain-resistant, water-cleanable epoxy grout.

.1 Applications: Washrooms, and porcelain tile tactile warning indicators.

.2 Colours: As selected by Consultant from manufacturer's full line.

.3 Products:

.1 Mapei; Kerapoxy CQ.

.2 Custom Building Products; CEG-IG 100 Solids Industrial Grade Epoxy Grout.

.3 Flextile; 100-Flex Epoxy.

.4 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

.2 Flexible grout: Silicone rubber to ASTM C920, non-solvent curing type; colour selected by Consultant from full range of colours to match other grout materials.

.1 Applications: Between tile and plumbing fixtures, expansion joints and other sealant-filled joints in tiling, including control, contraction, and isolation joints.

.2 Colours: As selected by Consultant from manufacturer's full line.

.3 Products:

.1 Mapei; Mapesil T Plus.

.2 Custom Building Products; Commercial 100Silicone Seal.

.3 Flextile; Ultra-Performance Hybrid Caulk.

.4 Substitutions: See Section 01 25 13 - Product Substitution Procedures.

2.5 ACCESSORY MATERIALS

.1 Mesh tape for cement backer board: 50 mm wide self-adhesive alkali-resistant polymer- coated fibreglass mesh tape.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

3.2 PREPARATION

.1 Protect surrounding work from damage.

.2 Vacuum clean surfaces.

.3 Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

.4 Tape joints and corners in cement board. Cover with skim coat of setting material to a feather edge.

3.3 INSTALLATION - GENERAL

.1 Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions and TTMAC (IM) recommendations.

.2 Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

.3 Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly.

.4 Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

.5 Form internal angles square and external angles square.

.6 Install non-ceramic trim in accordance with manufacturer's instructions.

.7 Sound tile after setting. Replace hollow sounding units.

.8 Keep control and expansion joints free of mortar, grout, and adhesive.

.9 Prior to grouting, allow installation to completely cure; minimum of 48 hours.

.10 Grout tile joints unless otherwise indicated. Use grout types indicated.

.11 At changes in plane and tile-to-tile control joints, use flexible grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.4 INSTALLATION - FLOORS - THIN-SET METHODS

.1 Over concrete substrates, install in accordance with TTMAC (IM) 311F, Detail A

(interior/exterior).

.2 Install movement joints in accordance with manufacturer's written instructions and TTMAC (IM) 301MJ.

3.5 INSTALLATION - WALL TILE

.1 On exterior or interior masonry or concrete walls, install in accordance with TTMAC (IM) 303W, thin set method.

.2 Over cementitious backer units, install in accordance with TTMAC (IM) 305W, Detail A.

.3 Over coated glass mat backer board, install in accordance with TTMAC (IM), 305W, Detail B.

.4 Over gypsum board on metal studs, install in accordance with TTMAC (IM) 304W, thin set method.

3.6 INSTALLATION - WALLS - LARGE FORMAT TILE

.1 Install large format tile on walls to TTMAC (IM) 304W, thin set method.

3.7 CLEANING

.1 Clean tile and grout surfaces.

3.8 PROTECTION

.1 Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Acoustical units and suspension systems.

1.2 RELATED REQUIREMENTS

.1 Section 23 37 13 – Diffusers, Registers and Grilles: Air diffusion devices in ceiling.

.2 Section 26 50 01 – Lighting: Light fixtures in ceiling system.

.3 Section 28 31 01 – Fire Alarm System (Addressable, Single Stage): Fire alarm components in ceiling system.

1.3 REFERENCE STANDARDS

.1 ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.

.2 ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2013.

.3 ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2014.

.4 CAN/ULC S102 - Method of Testing for Surface Burning Characteristics of Building Materials and Assemblies 2018.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

.2 Do not install acoustical units until after interior wet work is dry.

1.5 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Provide data on suspension system components and acoustical units.

.3 Samples: Submit two samples 150 by 150 mm in size illustrating material and finish of acoustical units.

.4 Samples: Submit two samples each, 150 mm long, of suspension system main runner.

.5 Maintenance materials: Supply the following for Owner's use in maintenance of project.

.1 See Section 01 60 00 - Product Requirements, for additional provisions.

.2 Extra acoustical units: Quantity equal to 5 percent of total installed.

1.6 SITE CONDTIONS

.1 Maintain uniform temperature of minimum 16 degrees C, and maximum humidity of 40% prior to, during, and after acoustical unit installation.

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Part 2 Products

2.1 ACOUSTICAL UNITS

.1 Acoustical Units – general: ASTM E1264 and CAN/ULC S102 for flame spread 25 or less and smoke develop rating less than 50.

.2 Acoustical tile Type ACT: washable, scrubbable, impact- and scratch resistant finish, ASTM E1264 Type with the following characteristics:

.1 Size: 610 by 610mm.

.2 Thickness: 15.8 mm.

.3 Light reflectance: 89 percent minimum, determined in accordance with ASTM E1264.

.4 Flame Spread: 25 or less

.5 Edge: Square.

.6 Surface colour: White.

.7 Suspension system: Prelude 15/16”

.8 Acceptable Products:

.1 Armstrong Kitchen Zone 673.

.2 Substitutions: See Section 01 25 13 - Product Substitution Procedures

2.2 SUSPENSION SYSTEMS

.1 Metal suspension systems - general: Complying with ASTM C635/C635M; die cut and interlocking components, with clips, splices, perimeter mouldings, and hold down clips as required.

.2 Exposed steel suspension system Type 1: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.

.1 Profile: Tee; 24 mm wide face.

.2 Construction: Double web.

.3 Finish: Powder-coated, colour as indicated in Section 09 06 10 - Material Schedule.

.4 Products:

.1 Armstrong; Prelude L Blizzard.

.2 CGC; Donn D; Powder White.

.3 Substitutions: See Section 01 25 13 - Product Substitution Procedures

2.3 ACCESSORIES

.1 Support channels and hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

.2 Perimeter mouldings: Same material and finish as grid.

.1 At exposed grid: Provide L-shaped moulding for mounting at same elevation as face of grid.

.3 Touch-up paint: Type and colour to match acoustical and grid units.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify that layout of hangers will not interfere with other work.

3.2 INSTALLATION - SUSPENSION SYSTEM

.1 Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented in this section.

.2 Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

.3 Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

.4 Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

.5 Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

.6 Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers to span the extra distance.

.7 Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

.8 Support fixture loads independently.

.9 Do not eccentrically load system or induce rotation of runners.

.10 Perimeter moulding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

.1 Use longest practical lengths.

.2 Overlap and rivet corners.

3.1 INSTALLATION - ACOUSTICAL UNITS

.1 Install acoustical units in accordance with manufacturer's instructions.

.2 Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

.3 Fit border trim neatly against abutting surfaces.

.4 Install units after above-ceiling work is complete.

.5 Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

.6 Cutting acoustical units:

.1 Cut to fit irregular grid and perimeter edge trim.

.2 Make field cut edges of same profile as factory edges.

.7 Where round obstructions occur, provide preformed closures to match perimeter moulding.

.8 Install hold-down clips on panels within 6 m of an exterior door.

3.2 TOLERANCES

.1 Maximum variation from flat and level surface: 3 mm in 3 m.

.2 Maximum variation from plumb of grid members caused by eccentric loads: 2 degrees.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Resilient sheet safety flooring.

.2 Resilient base.

.3 Installation accessories.

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.3 REFERENCE STANDARDS

.1 ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2017.

.2 ASTM F970 – Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading 2017.

.3 ASTM F1303 – Standard Specification for Sheet Vinyl Floor Covering with Backing 2004 (Reapproved 2014).

.4 ASTM F1344 – Standard Specification for Rubber Floor Tile 2015.

.5 ASTM F1516 – Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when recommended) 2013.

.6 ASTM F1861 – Standard Specification for Resilient Wall Base 2016.

.7 CAN/ULC S102.2 – Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies 2018.

.8 NFCA (FCRM) – National Floor Covering Association, Floor Covering Reference Manual Current Edition.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colours available; and installation instructions.

.3 Shop Drawings: Indicate seaming plans and floor patterns.

.4 Selection samples: Submit manufacturer's complete set of colour samples for Consultant's initial selection.

.5 Verification samples: Submit two samples, 300 by 300 in size illustrating colour and pattern for each resilient flooring product specified, and 300 mm long sample of each type of resilient moulding, transition and edge strip.

.6 Concrete sub-floor test report: Submit a copy of the moisture, alkalinity (pH), and adhesion test reports.

.7 Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

.8 Installer's qualification statement.

.9 Maintenance data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

.10 Maintenance materials: Furnish the following for Owner's use in maintenance of project.

.1 See Section 01 60 00 – Product Requirements, for additional provisions.

.11 Extra flooring material: Quantity equivalent to 5 percent of each type and colour. Provide sheet materials in single length, full width rolls.

.1 Extra wall base: Quantity equivalent to 5 percent of each type and colour.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Store materials off of the floor in an acclimatized, weather-tight space.

.2 Maintain temperature in storage area between 13 degrees C and 72 degrees C.

.3 Protect roll materials from damage by storing on end.

.4 Do not double stack pallets.

1.7 SITE CONDITIONS

.1 Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 21 degrees C to achieve temperature stability. Thereafter, maintain conditions above 13 degrees C.

Part 2 Product

2.1 SHEET FLOORING

.1 Resilient Vinyl Sheet Flooring - RSF: Comprised of a combination of high quality vinyl, with silicon carbide, aluminum trioxide and coloured quartz grains throughout the thickness.

.1 Manufacturers:

.1 Altro Stronghold 30

.2 Substitutions: See 01 25 13 – Product Substitution Procedures.

.2 Minimum requirements: Comply with ASTM F1303, Type I, Grade 1 with Class A non-woven polyester/cellulose glass fibre backing.

.3 Thickness: 3 mm nominal.

.4 Sheet width: 2000 mm minimum.

.5 Static load resistance: 2000 PSI minimum, when tested in accordance with ASTM F970.

.6 Slip Resistance: R12

.7 Seams: Heat welded.

.8 Integral coved base with cap strip.

.9 Colour: Architect to choose from full selection of colours.

.2 Welding rod: Solid bead in material compatible with flooring, produced by flooring manufacturer for heat welding seams, and in colour matching field colour.

2.2 RESILIENT BASE

.1 Resilient base - RB: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.

.1 Height: 152 mm.

.2 Thickness: 3.2 mm.

.3 Finish: Satin.

.4 Length: Roll.

.5 Colour: As selected by Architect. Allow for 3 colours.

.6 Accessories:

.1 Premoulded external corners and end stops

.2 Adhesives: as recommended by manufacturer

2.4 ACCESSORIES

.1 Subfloor filler: White premix latex; type recommended by adhesive material manufacturer.

.2 Primers and adhesives: Waterproof; types recommended by flooring manufacturer.

.3 Mouldings, transition and edge strips: Resilient.

.4 Filler for coved base: Plastic.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

.2 Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

.3 Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for

resilient flooring installation by testing for moisture, pH, and adhesion.

.1 Test in accordance with ASTM F710.

.2 Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.2 PREPARATION

.1 Remove existing resilient flooring and flooring adhesives; follow the written requirements of NFCA (FCRM).

.2 Prepare floor substrates as recommended by flooring and adhesive manufacturers.

.3 Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surfaces.

.4 Prohibit traffic until filler is fully cured.

.5 Clean substrate.

.6 Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - GENERAL

.1 Starting installation constitutes acceptance of sub-floor conditions.

.2 Install in accordance with manufacturer's written instructions.

.3 Spread only enough adhesive to permit installation of materials before initial set.

.4 Fit joints and butt seams tightly.

.5 Set flooring in place, press with heavy roller to attain full adhesion.

.6 Where type of floor finish, pattern, or colour are different on opposite sides of door, terminate flooring under centerline of door.

.7 Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

.1 Resilient mouldings, transition and edge strips: Attach to substrate using adhesive.

.8 Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 INSTALLATION - SHEET FLOORING

.1 Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

.2 Cut sheet at seams in accordance with manufacturer's instructions.

.3 Seal seams by heat welding in accordance with manufacturer's instructions, and ASTM F1516.

.4 Integral coved base: Install using coved base filler as backing at floor to wall junction.

Extend sheet flooring vertically to height indicated, and cover top edge with metal cap strip.

.1 At flush door frames and other projections, taper cove former 300 mm back from frame to provide flush cove at face of frame.

.2 Heat weld seam between flooring and coved base.

.3 Inside corners: Fit coved inside corners with “half butterfly” formed by cutting material at 45 degree angle from base of coving sharply tucked into inside corner, wrapped and joined to coved material facing non-prominent side wall. Heat weld seams.

.4 Outside corners: Fit coved outside corners with “butterfly inset” wrapped around corner at 45 degree angle. Starting from base of corner and joined on each side to flash coved material. Heat weld seams.

.5 Floor drains: Mechanically fasten flooring into clamping type floor drains. Install flooring into drain collar. Install fastening clamp and strainer. Seal flooring around full perimeter of drain with manufacturer’s recommended waterproof sealant.

3.5 INSTALLATION - RESILIENT BASE

.1 Fit joints tightly and make vertical. Minimize joints.

.2 Corners:

.1 Resilient Base Type: Mitre internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premoulded units.

.2 Install base on solid backing. Bond tightly to wall and floor surfaces.

.3 Scribe and fit to door frames and other interruptions.

3.6 CLEANING

.1 Remove excess adhesive from floor, base, and wall surfaces without damage.

.2 Clean in accordance with manufacturer's written instructions.

3.7 PROTECTION

.1 Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Rubber sheet flooring adhesively installed.

.2 Rubber tile flooring.

1.2 RELATED REQUIREMENTS

.1 Section 09 65 00 – Resilient Flooring: Resilient mouldings, transition and edge strips

1.3 REFERENCE STANDARDS

.1 ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension 2016.

.2 ASTM D2240 - Standard Test Method for Rubber Property-Durometer Hardness 2015e1.

.3 ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2017.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Manufacturer's printed data sheets for products specified.

.3 Shop Drawings: Fabrication and installation details, and layout, colours, and widths of track lines.

.4 Selection samples: Manufacturer's colour charts for flooring materials specified and lane line paints, indicating full range of colours and textures available.

.5 Verification samples: Actual flooring materials selected, not less than 300 mm square, mounted on solid backing.

.1 Include seaming sample in centre of each sample.

.6 Manufacturer's installation instructions: Indicate special procedures, conditions requiring special attention, and seaming, and line painting.

.7 Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

.8 Concrete sub-floor test report: Submit a copy of the moisture, alkalinity (pH), and adhesion test reports.

.9 Installer's qualification statement.

.10 Maintenance data: Include maintenance procedures, and recommended maintenance materials.

.11 Executed warranty.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: An experienced installer certified or approved in writing by the flooring manufacturer to be qualified for installation of specified flooring system and trained to paint lane lines on running track.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

.2 Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.7 SITE CONDITIONS

.1 Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 18 to 30 degrees C for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed.

1.8 WARRANTY

.1 Provide manufacturer's 15-year warranty against manufacturing defects, blemishes and excessive wear due to normal traffic.

Part 2 Products

2.1 PREFORMED ATHLETIC FLOORING

.1 Rubber tile flooring – RAF: Manufactured of dual durometer layers composed of 100 percent synthetic and natural rubber, specifically for ice rinks; skate- and spike-resistant.

.1 Thickness: Minimum 10 mm.

.2 Size: Nominal 910 mm square (36” square)

.3 Durometer Hardness, Type A: Minimum of 70, when tested in accordance with ASTM D2240.

.4 Surface texture: Hammered.

.5 Colour: As selected from manufacturer's standards.

.6 Manufacturers:

.1 Mondo America Inc; Ramflex.

.2 North West Rubber; ReAction.

.3 Substitutions: See 01 25 13 – Product Substitution Procedures.

2.2 ACCESSORIES

.1 Leveling compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.

.2 Flooring adhesive: Waterproof; polyurethane types recommended by flooring manufacturer.

.3 Transition Strips: Provide transition strips suitable for adjacent flooring. All transition strips to be ADA compliant.

Part 3 Execution

3.1 EXAMINATION

.1 Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

.2 Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

.3 Cementitious sub-floor surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH, and adhesion.

.1 Test in accordance with ASTM F710

.2 Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

.3 Do not install flooring until concrete subfloor has been cured 60 days.

.4 Verify that no curing compounds or sealers have been applied to the concrete subfloor. Report findings to Consultant.

3.2 PREPARATION

.1 Prepare floor substrates as recommended by flooring and adhesive manufacturers.

.2 Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/1000. Make slabs flat measured a tolerance of 3 mm in a 3 metre radius.

.3 Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.

.4 Broom and vacuum clean areas to receive athletic flooring immediately before beginning installation.

3.3 INSTALLATION

.1 Starting installation constitutes acceptance of sub-floor conditions.

.2 Comply with manufacturer's recommendations.

.3 Rubber tile flooring - RAF:

.1 Lay out centre lines in spaces to receive tile flooring, based on location of principal walls. Start tile installation from centre and adjust as necessary to avoid tiles less than one-half width at perimeter.

.2 Loose lay interlocking tiles square with room axis, matching for colour and pattern by selecting from cartons and mixing as recommended by manufacturer.

.3 Adhere tiles where indicated.

3.4 CLEANING

.1 Clean flooring using methods recommended by manufacturer.

3.5 PROTECTION

.1 Prohibit foot and rolling traffic for minimum period in accordance with manufacturer's instructions.

.2 Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Performance.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Surface preparation.

.2 Site application of paints.

.3 Scope: Finish exterior bare, primed steel and galvanized steel surfaces; interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, and repainting of existing surfaces indicated.

.4 Do not paint or finish the following items:

- .1 Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory-finished.
- .2 Items indicated to receive other finishes.
- .3 Items indicated to remain unfinished.
- .4 Fire-rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
- .5 Natural stone.
- .6 Floors, unless specifically indicated.
- .7 Glass.
- .8 Acoustical materials, unless specifically indicated.
- .9 Concealed pipes, ducts, and conduits.

1.2 REFERENCE STANDARDS

.1 MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association Current Edition.

.2 MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual Current Edition.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling of work in occupied areas:

- .1 Submit work schedule minimum of 48 hours in advance of proposed operations to Owner for review.
- .2 Paint occupied areas in accordance with approved schedule. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.
- .3 Obtain written authorization from Owner for changes in work schedule.
- .4 Schedule repainting operations to prevent disruption by other trades if applicable and by occupants in and about building.

1.4 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

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.2 Product data: Provide complete list of products to be used, with the following information for each:

.1 Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").

.2 MPI product number (e.g. MPI 47).

.3 Cross-reference to specified paint system(s) product is to be used in; include description of each system.

.3 Samples: Submit three paper "draw down" samples, 216 by 279 mm in size, illustrating range of colours available for each finishing product specified.

.1 Where sheen is specified, submit samples in only that sheen.

.2 Where sheen is not specified, discuss sheen options with Consultant before preparing samples, to eliminate sheens definitely not required.

.3 Retain approved draw downs on site, as acceptable standard for colour and sheen.

.4 Maintenance data: Submit data including finish schedule showing where each product/colour/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and colour samples of each colour and finish used.

.5 Maintenance materials: Supply the following for Owner's use in maintenance of project.

.1 See Section 01 60 00 - Product Requirements, for additional provisions.

.2 Extra paint and finish materials: one 4 L of each colour; from the same product run, store where directed.

.3 Label each container with colour in addition to the manufacturer's label.

1.5 QUALITY ASSURANCE

.1 Applicator qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

.2 Container label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, colour designation, and instructions for mixing and reducing.

.3 Paint materials: Store at minimum ambient temperature of 7 degrees C and a maximum of 32 degrees C, in ventilated area, and as required by manufacturer's instructions.

.4 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Owner. After completion of operations, return areas to clean condition to approval of Owner.

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1.7 SITE CONDITIONS

.1 Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

.2 Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

.3 Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

.4 Provide lighting level of 860 lx measured mid-height at substrate surface.

Part 2 Products

2.1 MANUFACTURERS

.1 Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

.2 Provide paint and finishes from manufacturers with each paint line having a minimum of four tint base mixtures, and minimum four sheen levels, including matte, eggshell, semi- gloss and gloss.

2.2 PAINTS AND FINISHES - GENERAL

.1 Paints and finishes: Ready mixed, unless intended to be a site-catalyzed paint.

.1 Where MPI paint numbers are specified, provide products listed in the MPI (APL) for specified MPI categories.

.2 Use paint finish coats with minimum volume solids of 36 percent before tinting.

.3 Use highest quality products for material such as linseed oil, shellac, turpentine, etc. not specifically listed by brand name.

.4 Conform to latest MPI requirements for painting and repainting work including preparation and priming.

.5 Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

.6 Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and site experience.

.7 For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base colour.

.8 Supply each paint material in quantity required to complete entire project's work from a single production run.

.9 Do not reduce, thin, or dilute paint or finishes or add materials unless such

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procedure is specifically described in manufacturer's product instructions.

.2 Volatile Organic Compound (VOC) Content:

.1 Provide paints and finishes that comply with the most stringent requirements specified in the following:

.1 Architectural coatings VOC limits of Province in which the project is located.

.3 Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Consultant from the manufacturer's full line.

.4 Colours: As indicated on Drawings.

.1 Extend colours to surface edges; colours may change at any edge as directed by Consultant.

.2 In finished areas, finish pipes, ducts, conduit, and equipment the same colour as the wall/ceiling they are mounted on/under.

.3 In utility areas, finish equipment, piping, conduit, and exposed duct work in colours according to the colour coding scheme indicated.

2.3 PAINT AND REPAINT SYSTEMS - INTERIOR

.1 Perform painting work in accordance with MPI Premium Grade requirements.

.2 INT 3.2A - Latex Floor Enamel

.1 Surfaces include: new concrete floors LATEX FLOOR ENAMEL [insert gloss level]

.3 INT 3.2F - Concrete Floor Sealer

.1 Surfaces include: new and existing concrete floors

.4 INT 4.2D - High-performance architectural latex over latex block filler.

.1 Surfaces include: New CMU, unless scheduled to receive epoxy paint finish

.5 RIN 4.2K - High performance architectural latex

.1 Surfaces include: Existing CMU previously painted with latex-based finishes

.6 INT 4.2F - Epoxy ("Tile-Like") over latex block filler (for dry environments)

.1 Surfaces include: CMU in change rooms and where indicated.

.7 INT 4.2G - Epoxy ("Tile-Like") over epoxy block filler (for wet environments)

.1 Surfaces include: CMU in toilet and shower areas, unless otherwise indicated.

.8 INT 5.1D - Alkyd, dry-fall, over quick-dry alkyd primer.

.1 Surfaces include: Exposed OWSJ scheduled to be painted.

.9 INT 5.1E - Alkyd over quick-dry alkyd primer.

.1 Surfaces include: Exposed structural steel, railings, guards, ladders, and other metal fabrications; factory-primed ferrous metal access panels and fire extinguisher cabinets.

.10 INT 5.3L - Alkyd (over water-based galvanized primer)

.1 Surfaces include: New hollow metal doors and frames

.11 INT 5.3P - Alkyd dry-fall over water-based galvanized primer: For low contact/traffic areas only.

.1 Surfaces include: Underside of steel deck where indicated, exposed galvanized steel including pipe, conduit, ductwork, and hangers.

.2 Prepare galvanized steel ductwork in accordance with topcoat manufacturer's instructions, including use of direct-to-metal primer before topcoating.

.12 Glue-laminated wood components (non-MPI system): High-adhesion, UV-stable, water- repellent, low-VOC finishing system forming a part of factory-applied protective coating as part of glue laminated wood specifications, and as follows:

.1 Factory-applied protective undercoat: Sansin KP-12, tinted.

.2 Intermediate coats: Two coats Sansin Precision Coat ENS, satin finish. Colour selected by Consultant.

.3 Top coat: One coat Sansin ENS Optimum Clear, satin finish.

.13 INT 6.3WW - Water-based varnish, clear (over water-based stain)

.1 Surfaces include: Coiling wood door counter door.

.14 INT 6.4PP - Fire-retardant, pigmented, water-based: ULC certified.

.1 Surfaces include: Electrical equipment mounting boards.

.15 INT 9.2B - High-performance architectural latex over latex primer sealer.

.1 Surfaces include: New gypsum board and plaster surfaces.

.16 INT 9.2F - Epoxy-modified latex over latex primer sealer.

.1 Surfaces: Gypsum board scheduled to receive epoxy paint.

2.4 PAINT SYSTEMS - EXTERIOR

.1 Perform painting work in accordance with MPI Premium Grade requirements.

.2 E T 5.1D - Alkyd over alkyd metal primer.

.1 Surfaces include: Structural steel and metal fabrications.

.3 E T 5.3N - Alkyd over water-based galvanized primer.

.1 Surfaces include: Hollow metal doors and frames.

.4 Wood soffits (non-MPI system): Solvent-based blend of linseed oils and alkyds; penetrating; UV-resistant.

.1 One coat Messmer's U.V. Plus Natural Wood Finish.

2.5 ACCESSORY MATERIALS

.1 Accessory materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin application of paints and finishes until substrates have been properly prepared.

.2 Verify that surfaces are ready to receive work as instructed by the product manufacturer.

.3 Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

.4 Test shop-applied primer for compatibility with subsequent cover materials.

.5 Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

.1 Gypsum board: 12 percent.

.2 Masonry and concrete: 12 percent.

3.2 PROTECTION OF IN-PLACE CONDITIONS

.1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Consultant.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Exterior Building Signage

.2 Interior Room Signage

.3 Wayfinding

1.2 REFERENCE STANDARDS

.1 CSA B651 - Accessible Design for the Built Environment 2018.

.2 CSA C22.1 - Canadian Electrical Code, Part 1 (25th Edition), Safety Standard for Electrical Installations 2021.

1.3 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colours, locations, overall dimensions of each sign.

.3 Signage schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colours.

.1 When room numbers to appear on signs differ from those on Drawings, include the drawing room number on schedule.

.2 When content of signs is indicated to be determined later, request such information from Owner through Consultant at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.

.3 Submit for approval by Owner through Consultant prior to fabrication.

.4 Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

.5 Selection samples: Where colours are not specified, submit two sets of colour selection charts or chips.

.6 Verification samples: Submit samples showing colours specified.

.7 Manufacturer's installation instructions: Include installation templates and attachment devices.

.8 Manufacturer's qualification statement.

1.4 QUALITY ASSURANCE

.1 Manufacturer qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

.2 Source limitations: Obtain each sign type through one source from a single manufacturer.

.3 Regulatory requirements: Comply with CSA B651 and local provisions as adopted by Authorities Having Jurisdiction.

.4 Electrical components, devices, and accessories: Listed and labelled as defined in CSA C22.1, by a testing agency acceptable to the Authorities Having Jurisdiction and marked for the intended use.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Package signs as required to prevent damage before installation.

.2 Store take adhesive at normal room temperature.

1.6 SITE CONDITIONS

.1 Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

.2 Maintain this minimum temperature during and after installation of signs.

Part 2 Products

2.1 SIGNAGE APPLICATIONS

.1 Room Identification

.1 Supply and install Room identification to be 50mm x 250mm limacoid, engraved, and glued to doors. Provide one (1) identification plate for each interior door on this project. Colour to be selected by Architect.

.2 Change Rooms and Washrooms:

.1 Pictographs be raised with Grade 1 Braille in the lower right corner. Signage colour to be MB-17 Aluminum Satin image with background colour in Metalbrite finishes. “Men” and “Women” and contemporary gender neutral as indicated by plan drawings and selected from suppliers/manufacturer’s standard range. Text shall be written in raised characters underneath the pictograph. Characters shall be 25mm in height, in Sans-serif. Mounted with screws. Plaque format to be 7.7.0 by Insign, Preside Sign Systems, or approved equal.

.3 Cut-out Letters

.1 Manufacturer: Gemini Incorporated; Flat Cut Metal

.2 Products from other manufacturer’s that meeting

.3 Flat cut metal letters, numbers, and symbols, laser or waterjet cut from 9.5 mm thick aluminum sheet, alloy 5052.

.1 Finish: Baked acrylic polyurethane face and returns.

.2 Colour and sheen: selected by Consultant from manufacturer's full range.

.4 Font (typeface):

.1 Helvetica, Arial, or other sans-serif font

.2 Upper case

.3 Letter height: as per drawings

.4 English, wording and letters as indicated.

.5 Mounting – double rail: two rows of C-Channel painted or anodized aluminum rails mounted with threaded aluminum bolts into in-line stud bosses. Letters attached to rails with conceal fasteners; minimum four per letter (two per rail). Allow for 25 mm clear standoff of rails from face of building.

.1 Location: Letters over D115B

.6 Mounting – stud mount: aluminum threaded bolts into in-line stud bosses, four per letter. Allow for 25 mm clear standoff off letters from face of building.

.1 Location: Letters over D100A

2.2 ACCESSORIES

.1 Concealed screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

.2 Exposed screws: Stainless steel

.3 Tape adhesive: Double-sided tape, permanent adhesive.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

.2 Install neatly, with horizontal edges level.

.3 Protect from damage until Substantial Performance; repair or replace damaged items.

.4 Installation – Cut-Out Letters

.1 Install letters on building structure in accordance with shop drawings and manufacturer's instructions.

.2 Space letters and symbols evening, level and aligned

.3 Install cut-out letters on mounting rails or stud mount with concealed fasteners.

.4 Provide mounting hardware and fasteners to secure letters to building structurer in locations indicated.

3.3 CLEANING

.1 Final cleaning: upon completion remove surplus materials, rubbish, tools and equipment

.2 Leave signs clean

.3 Touch up damaged finishes.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Tactile warning indicators

1.2 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast in Place Concrete

.2 Section 03 35 11 – Concrete Floor Finishes

1.3 REFERENCE STANDARDS

.1 CSA Group

.1 CSA-B651-12(R2017), Accessible Design for the Built Environment

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate installation of tactile warning indicators with concrete finishing work, and tiling work.

1.5 SUBMITTALS

.1 Section 01 33 00 – Submission procedures.

.2 Product data: Provide data on each type of tactile warning indicators specified.

.3 Samples: Submit two samples illustrating colour and finish.

Part 2 Products

2.1 TACTILE INDICATORS

.1 Tactile indicators: Truncated aluminum concentric rings:

.1 Domes: Truncated domes measuring nominal 4 mm high, 22 mm base diameter, and 12 mm top diameter, spaced 55 mm O.C.

.3 Colour: As selected by consultant from full product line

.4 Acceptable Product:

.1 Kenesik Advantage One – Individual Domes

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify exact location before installation.

3.2 INSTALLATION

.1 Type TI-1 - Full body porcelain tile: Specified in Section 09 30 00.

END OF SECTION

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PART 1 General

1.1 SUBMITTALS

.1 Action Submittals:

.1 Shop Drawings: Illustrate products, installation, and relationship to adjacent construction.

.2 Product Data: Manufacturer's descriptive data and product attributes for compartments and hardware.

.3 Samples: 75x75mm samples for color selection.

1.2 QUALITY ASSURANCE

.1 Installer Qualifications: Firm specializing in work of this Section with minimum 2 years of experience.

.2 Regulatory Requirements:

.1 Fire hazard classification: Class A rated, tested to ASTM E84.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle products in accordance with manufacturer's instructions.

1.4 PROJECT CONDITIONS

.1 Do not install products when environmental conditions are outside of manufacturer's recommended limits.

1.5 WARRANTIES

.1 Provide manufacturer's 3-year warranty against defects in materials and workmanship.

PART 2 Products

2.1 MANUFACTURERS

.1 Basis of Design Elite Plus by Hadrian Solutions, www.hadrian-inc.com.

.2 Substitutions: Refer to Section 01 25 13 for Product Substitution Procedures.

2.2 MATERIALS

.1 Galvanized Steel Sheet: ASTM A653, Grade GR53.

.2 Stainless Steel Sheet: ASTM A666, Type 304.

.3 Core: Kraft paper honeycomb.

.4 Hardware:

.1 Material: Stainless steel.

.2 Panel-to-pilaster, panel-to-wall, and pilaster-to-wall connections: Stirrup brackets. Finished to match panels.

.3 Hinges: Continuous type, stainless steel with stainless steel hinge pin.

.4 Coat hook and bumper: Combination type; one per compartment.

.5 Latch: Barrier-free lever type, concealed, with emergency access feature

2.3 COMPONENTS

.1 Toilet Compartments:

.1 Style: Pedestal.

.2 Series: Elite Plus.

.3 Doors and panels: 1828mm high, mounted 152mm above finished floor, with continuous channels eliminating sightline gaps.

2.4 FABRICATION

.1 Doors, Panels, and Pilasters:

.1 Construction: Galvanized steel face sheets bonded to honeycomb core.

.2 Edges: Formed edges welded and interlocked with locking bar, mitered, welded, and ground smooth.

.3 Thickness:

.1 Doors and panels: 25mm.

.2 Pilasters: 31mm.

.2 Head Rail: Extruded aluminum with anti-grip top surface.

.3 Pilaster Shoes: Stainless steel.

2.5 FINISHES

.1 Steel:

.1 Type: Baked-on powder coating, to be selected from manufacturer's full color range

.2 Graffiti resistance: Pass ASTM D6578.

.2 Stainless Steel: No. 4 satin.

PART 3 Execution

3.1 INSTALLATION

.1 Install in accordance with manufacturer’s instructions and approved Shop Drawings.

.2 Adjust for floor variations with screw jack integral in pilasters.

3.2 CLEANING

.1 Clean completed work in accordance with manufacturer’s instructions.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Corner guards.

1.2 SUBMITTALS

.1 See Section 01 33 00 - Submittal Procedures.

.2 Product data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.

.3 Shop Drawings: Include plans, elevation, sections, and attachment details.

.4 Samples: Submit samples illustrating component design, configurations, joinery, colour and finish.

.1 Submit two sections of each type of corner guards, 610 mm long.

.5 Manufacturer's instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver wall and door protection items in original, undamaged protective packaging.

.2 Protect work from moisture damage.

.3 Store products in either horizontal or vertical position, in conformance with manufacturer's instructions.

Part 2 Products

2.1 PRODUCT TYPES

.1 Corner guards CG-1 surface mounted:

.1 Material: Polyethylene terephthalate (PET or PETG); PVC-free.

.2 Width of wings: See to Section 09 06 10 - Material Schedule.

.3 Corner: Square.

.4 Colour: As indicated.

.5 Length: One piece.

.6 Mounting: Clear adhesive.

.2 Corner guards CG-2 - surface mounted:

.1 Material: Type 304 stainless steel, No. 4 finish, 1.6 mm thick.

.2 Width of wings: 76 mm.

.3 Corner: Square.

.4 Length: One piece.

.5 Mounting: Clear adhesive.

.3 Adhesives and primers: As recommended by manufacturer.

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2.2 FABRICATION

.1 Fabricate components with tight joints, corners and seams.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that substrate surfaces for adhered items are clean and smooth.

.1 Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.

3.2 INSTALLATION

.1 Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

.2 Position corner guard at top of wall base to height indicated.

.1 Apply adhesive to back surface of each leg of corner guard.

.2 Position corner guards in place, and apply pressure along entire length until units are tight and secure.

3.3 TOLERANCES

.1 Maximum variation from required height: 3 mm.

3.4 CLEANING

.1 Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 22 16 - Non-structural Metal Framing: furring and blocking in stud walls for accessories.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM B456, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-B651, Barrier-Free Design.

.2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product data: manufacturer's product information identify manufacturer, model numbers. Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors.

.3 Samples:

.1 For items requiring colour selection by Consultant, submit colour samples representing full colour selection for each item.

1.4 CLOSEOUT SUBMITTALS

.1 Provide closeout submittals in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide maintenance data for accessories for incorporation into maintenance manual. Include information on recommended refill products for refillable components.

1.5 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra stock materials:

.1 Fill units with necessary supplies shortly before Substantial Performance of the Work. Unused supplies from opened packages/cartons remain the property of the Owner.

.2 In addition to filling units, provide one (1) full package/carton of supplies for each unit for Owner’s future use.

.2 Spare parts and tools:

.1 Provide special tools required for accessing, assembly/disassembly or removal for accessories.

.2 Provide keys and other opening devices to Owner.

Part 2 Products

2.1 MATERIALS

.1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.

.2 Stainless steel sheet: ASTM A666 Type 304, with AISI No.4 finish except where specified otherwise.

.3 Stainless steel tubing: Type 304, commercial grade, seamless welded, unless specified otherwise.

.4 Fasteners:

.1 Screws and bolts: Type 304 stainless-steel tamper-proof design.

.2 Expansion shields fibre, lead or rubber as recommended by fixture manufacturer for component and its intended use.

2.2 COMPONENTS

.1 Use one manufacturer's products for all like items.

.2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 13 – Product Substitution Procedures.

.3 Provide purpose made anchors and backing plates for components; including backing plates and carriers for grad bars.

.4 Coat Hook: surface mounted collapsable hook. Spring loaded up to 11kg, 18-gauge stainless steel, brushed finish.

.1 Acceptable Product: Frost 1150-SS

.5 Grab Bar 01: Bar 38 mm diameter x 18-gauge stainless steel tube, satin finish, peened, concealed mounting with snap flange, 610 mm.

.1 Acceptable Product: Bobrick B-6806x24

.6 Grab Bar 02: Bar 38 mm diameter x 18-gauge stainless steel tube, satin finish, peened, concealed mounting with snap flange, 1065 mm.

.1 Acceptable Product: Bobrick B6806x42

.7 Grab Bar 03: 38 mm diameter x 18-gauge stainless steel tube, satin finish, peened, concealed mounting with snap flange, 90-degree angle, 760 x 760 mm.

.1 Acceptable Product: Bobrick B-6898.99

.8 Grab Bar 04: 38 mm diameter x 18-gauge stainless steel tube, satin finish, peened, concealed mounting with snap flange, 90-degree angle, 760 x 1000 mm.

.1 Acceptable Product: Bobrick B-54546.99 and B-5854.99

.1 Provide Left and Right Grab bars as appropriate for each shower

.9 Mirror with Shelf (WM-1): stainless steel bright polished frame mirror with 100mm shelf, 6 mm (1/4”) float glass mirror, Complete with concealed wall hangers.

.1 Acceptable Product: Bobrick B-166 2436

.10 Mirror, tilted (WM-2): beveled edges of frame at mirror. Mirror extends 100mm from wall at top and 25mm at base. Frame stainless steel with type 304 satin finish.

.1 Acceptable Product: Bobrick B-293 2436

.11 Mop and Broom Holder: combination stainless steel shelf with mop and broom holders, 863 mm length.

.1 Acceptable product: Bobrick B-239

.12 Paper Tower Dispenser – Folded Paper Style. Surface mounted. Satin finish stainless steel for C-fold or multi fold towels. Door has tumbler lock and piano hinge.

.1 Acceptable Product: Bobrick B-262

.13 Soap Dispenser ABS vertical tank, surface mounted.

.1 Acceptable Product: Bobrick B-2111

.14 Soap Dish: recessed, stainless steel with matte polished finish. 185x125mm

.1 Acceptable Product: Bobrick B-4380

.15 Toilet Paper Dispenser: Stainless steel surface mounted multi-roll, tumbler lock

.1 Acceptable Product: Bobrick B-4288; Watrous ASI 20030; Bradley 5A10

.16 Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless-steel piano-type hinge, removable receptacle.

.1 Acceptable Product: Bobrick B-270.

.17 Baby Change Station: Stainless Steel, recessed-mounted. Horizontal changing station with a wall mounted stainless steel bag hook. Polypropylene bed surface with antimicrobial product protection

.1 Acceptable Product Koala Kare KB310-SSRE

.18 Folding Shower Seat: reversible sold phenolic folding shower seat. Durable water-resistant ivory coloured seat of 13mm solid phenolic. Reversable for left or right-hand field installation. Frame of 304-stainless steel.

.1 Acceptable Product: Bobrick B-5181

.19 Shelf: 125mmx455mm stainless steel, satin finish. 19mm return at front and ends. Stainless steel mounting brackets.

.1 Acceptable Products: B-296x18

.20 Waste Receptacle: Stainless steel 18-gauge, surface-mounted with all-welded construction. Exposed surfaces satin finish. Top edge shall be hemmed and bottom of waste receptacle shall have recessed finger grip for safe handling. Liner mate to facilitate install and removal of trash liners. Capacity 48.3L (12.75-gal).

.1 Acceptable Product: Bobrick B-277

.21 Shower Curtain and Rod:

.1 Rod: Type 304 Stainless Steel 20-gauge tube. 1” diameter. Finish: Bright stainless steel.

.2 Curtain: Heavy duty vinyl material, 13-gauge, flame retardant, anti microbial

.3 Provide rings and rod flanges as recommended by manufacturer

.4 Refer to drawings for shower sizes.

.5 Acceptable Product: Inpro Corporation – Endurant

2.3 FABRICATION

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Shop assemble components and package complete with anchors and fittings.

.7 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates or rough-in measurements as required.

.8 Provide steel anchor plates and components for installation on studding and building framing.

2.4 FINISHES

.1 Chrome and nickel plating: to ASTM B456, finish as specified by item.

.2 Hot dip galvanized ferrous metal anchors and fastening devices to CSA G164.

.3 Manufacturer’s or brand names on face of units not acceptable.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install components in accordance with manufacturer's instructions and templates.

.2 Mounting heights to CAN/CSA-B651, except where indicated otherwise.

.3 Coordinate installation of anchors, brackets and hangers with other Work. Ensure furring, blocking, and framing is in place.

.4 Supply drawings and templates for building into other work.

.5 Install and secure fixtures rigidly in place as follows:

.1 Stud walls: install steel back-plate to stud prior to gypsum board finish. Provide plate with threaded studs or plugs.

.6 Install components on built-in anchors and backing plates provided by manufacturer.

.7 Install grab bars to resist more than 408 kg load without causing damage to bar or fastener pull out.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 06 10 53 – Rough Carpentry. Blocking and backing for attachment of items specified in this section.

.2 Division 07 – Roofing

1.2 REGULATORY REQUIREMENTS

.1 All items supplied are to be CSA approved.

1.3 SUBMITTALS

.1 Submit shop drawings and product data to requirements of Section 01 33 00.

.2 Submit operation and maintenance data to requirements of Section 01 33 00.

.3 Submit manufacturer's descriptive literature indicating materials, finishes and installation instructions for each type of equipment specified.

.4 Show dimensions, locations of service outlets, built-in equipment, groups of service fittings, special installation conditions and other related data required for coordination and connection.

1.4 QUALITY ASSURANCE

.1 Qualifications.

.1 Manufacturer: work of this Section to be executed by manufacturing speculating in design, fabrication, and installation of healthcare equipment specified, and having minimum of 5 years documented experience.

.2 Loading and Safety Assurance: work of this Section to meet requirements of governing codes and jurisdiction and to comply with properly engineered loading and safety criteria for intended use.

Part 2 Products

The following is an itemized list of products followed by required specifications for each of these products.

2.1 PRECAST CONCRETE SPLASHPADS AND ROOF SPLASHPADS

.1 Pre-cast concrete splashpads c/w integral steel reinforcing, as manufactured by Barkman Concrete Ltd., or equivalent. Sizes 3" x 12" wide x 48" long, sloped to drain. Locate as shown on Floor Plans & Elevations.

Part 3 Execution

3.1 INSPECTION

.1 Verify that surfaces and internal wall blocking are ready to receive work and opening

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dimensions are as instructed by the manufacturer.

.2 Beginning of installation means acceptance of substrate conditions.

3.2 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Manual disappearing stairways.

1.2 REFERENCES

.1 ANSI A14.9: Safety Requirements for Ceiling Mounted Disappearing Climbing Systems.

1.3 SUBMITTALS

.1 Submit under provisions of Section 01 33 00 – Submittals.

.2 Manufacturer's data sheets on each product to be used, including:

- .1 Preparation instructions & recommendations.
- .2 Storage and handling requirements & recommendations.
- .3 Installation methods.

.3 Shop Drawings for Stairs:

- .1 Plan and section of stair installation.
- .2 Indicate rough opening dimensions for ceiling and/or roof openings.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Store stairway until installation inside under cover in manufacturer's unopened packaging. If stored outside, under a tarp or suitable cover.

1.5 WARRANTY

.1 Limited Warranty: One year against defective material and workmanship, covering parts only. Defective parts, as deemed by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturer:
Precision Ladders, LLC,
P.O. Box 2279; Morristown, TN 37816-2279;
Tel: 423-586-2265; Fax: 423-586-2091;
www.PrecisionLadders.com

.2 Substitutions: Refer to Section 01 25 13 – Product Substitution Procedures.

2.2 MANUAL DISAPPEARING STAIRWAY

.1 Stairs for ceiling heights 12’-1” – 13’-6”:

- .1 Model 2000 (ceiling height in inches).

.2 Performance Standard: Unit shall comply with ANSI A14.9, Commercial Type, for rough openings between 27 inches to 39 inches. Residential Type for rough openings between 22-1/2 inches to 27 inches. Stairway capacity shall be rated at 500 lbs.

.3 Accessories:

.1 Steel pole to aid opening and closing stairways.

.2 Stairs for ceiling heights 12’ 1” – 13’6” shall be equipped with 2-Fold As-sists.

.3 Keyed lock for door

.4 Components:

.1 Ceiling heights 12’ 1”–13’ 6” require opening of 22½” x 72”. Site verify ceiling height prior to fabrication.

.5 Stairway Stringer: 6005-T5 Extruded aluminum channel 5” x 1” x 1/8”; tri-fold design; steel blade type hinges; adjustable feet with plastic Mar-guard. Pitch shall be 63°.

.6 Stairway Tread: 6005-T5 extruded aluminum channel 5 3/16 inches by 1 1/4 inches by 1/8 inch. Depth is 5 3/16 inches. Deeply serrated top surface. Riser Height: 9-1/2 inches. Clear Tread Width for Standard Width: 18 inches.

.7 Railing: Aluminum bar handrail riveted to stringers, upper section only.

.8 Frame:

.1 If ceiling to floor (or roof deck) above is under 12”, frame shall be 1/8” steel formed channel, box.

.2 When ceiling to floor (or roof deck) above is 12” or greater, the frame shall be 1/8” steel, 63° (with building steps) on the hinge end, 90° on the other end, custom depth to fill distance from ceiling to floor above. This custom frame will require a longer opening in the floor above than is required at the ceiling level.

.9 Door Panel

.1 Door panel shall be constructed of 20-gauge steel and have a 2-hour fire rating for use in fire-rated ceiling assemblies as issued by Warnock-Hersey or other appropriate independent testing/licensing agency.

.10 Hardware:

.1 Steel blade type hinge connecting stringer sections. Zinc plated and clear trivalent chromate sealed.

.2 Steel operating arms, both sides. Zinc plated and clear trivalent chromate sealed.

.3 Double acting steel springs and cable, both sides.

.4 Rivets rated at 1100 lb (499 kg) shear strength each.

.5 Steel section alignment clips at stringer section joints.

.6 Molded rubber guards at corners of aluminum door panel.

.7 Finishes: Mill finish on aluminum stairway components. Prime coat on frame.

2.3 FABRICATION

.1 Completely fabricate stairway ready for installation before shipment to the site.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin installation until rough opening and structural support have been properly prepared.

.2 If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

.3 Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.2 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

3.3 PROTECTION

.1 Protect installed products until completion of project.

.2 Touch-up, repair or replace damaged products before Substantial Completion.

3.4 FIELD QUALITY CONTROL

.1 The manufacturer has representatives in all areas of the United States and Canada. For the name of the closest representative, call (800) 225-7814.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Manual, horizontal window roller shades at Multipurpose Room windows.

1.2 RELATED REQUIREMENTS

.1 Section 05 41 00 – Structural Metal Lightweight Framing.

.2 Section 09 22 16 – Non-Structural Metal Stud Framing.

1.3 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product Data: Provide manufacturer's data sheets describing components, accessories, dimensions, tolerances for window openings required, colours and textures.

.3 Shop Drawings: Indicate dimensions in relation to window jambs, operator details, top rail, connections and required clearances.

1.4 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide a 5 (five) year warranty to include coverage for failure to meet specified requirements.

Part 2 Products

2.1 MANUFACTURERS

.1 Altex Design Canada

.2 Substitutions: Refer to Section 01 25 13 – Product Substitution Procedures

2.2 SYSTEM DESCRIPTION

.1 Infinite positioning of window shade.

.2 Noise reduction seals for sound isolation and absorption of mechanism noise.

.3 Shade Orientation: Shade cloth to roll at window side of roller.

.4 Degree of Openness: 10%.

.5 Provide for smooth and quiet operation

.6 Manuel operation.

2.3 COMPONENTS

.1 Horizontal Shade Band:

.1 Assembly: Fabric, internal bottom bar, attachment of shade bands to roller tube.

.2 Fabric: Single thickness, non-ravelling thick, vinyl fabric.

.1 Yarn: 21% polyester and 79% reinforced vinyl.

.2 Colour: Selected from manufacturer's available range

.2 Operation: Manual operation with chain.

.1 Provide chain anchor at height recommended by manufacturer.

.3 Shade Roller Tube: Extruded aluminum, 50mm diameter, with existing basement reinforced internal ribs to provide maximum span without tube deflection.

.4 Exterior Oval Hem Bar: 22mm tubular extruded aluminum, with recess to secure fabric, without visible seams.

.5 Mounting Brackets: Galvanized steel, snap on brackets for wall mounting.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Examine substrate and conditions for installation.

.3 Beginning of installation means acceptance of substrate and project conditions.

3.2 INSTALLATION

.1 Install units and their accessories to manufacturer's instructions.

.2 Securely screw end plugs to conceal exposed cut aluminum of exterior hem bar.

.3 Securely anchor units plumb and level, using hardware and accessories to provide smooth operation without binding.

3.3 TOLERANCES

.1 Maximum variation of gap at window opening perimeter: 6mm per 2.4m.

.2 Maximum offset from level: 3mm.

.3 Use manufacturer's edge clearance requirements for shades where the width-to-height ratio exceeds 1:3.

3.4 ADJUSTING

.1 Adjust units for smooth operation.

.2 Adjust shade and shade cloth to hang flat without waves, folds, or distortion.

.3 Replace any units or components which do not hang properly or operate smoothly.

3.5 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Clean exposed surfaces and edges/ends, including metal and shade cloth, using non-abrasive materials and methods recommended by manufacturer. Remove and replace work which cannot be satisfactorily cleaned.

3.6 CLOSEOUT ACTIVITIES

.1 Demonstration: Demonstrate operation method and instruct Owner's personnel in the proper operation and maintenance of the window shade assembly.

END OF SECTION

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Part 1 General

1.1 SECTION INCLUDES

.1 Countertops for architectural cabinet work.

1.2 RELATED REQUIREMENTS

.2 Section 06 40 00 – Architectural Woodwork.

1.3 REFERENCE STANDARDS

.1 ANSI A208.1 - American National Standard for Particleboard 2016.

.2 AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, Canada Version 4.0 2021.

.3 ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.

.4 ISFA 3-01 - Classification and Standards for Quartz Surfacing Material 2013.

.5 MIA (DSDM) - Dimensional Stone Design Manual, Version VIII 2016.

.6 NEMA LD 3 - High-Pressure Decorative Laminates 2005.

1.4 SUBMITTALS

.1 See Section 01 33 00 – Submittal Procedures.

.2 Product data: Manufacturer's data sheets on each product to be used, including:

.1 Preparation instructions and recommendations.

.2 Storage and handling requirements and recommendations.

.3 Shop Drawings: Complete details of materials and installation; combine with Shop Drawings of cabinets and casework specified in other sections.

.4 Verification samples: For each finish product specified, minimum size 300 mm square, representing actual product, colour, and patterns.

.5 Installation instructions: Manufacturer's installation instructions and recommendations.

.6 Installer's qualification statement.

.7 Maintenance data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.5 QUALITY ASSURANCE

.1 Installer qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Store products in manufacturer's unopened packaging until ready for installation.

.2 Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 SITE CONDITIONS

.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

Part 2 Products

2.1 COUNTERTOPS

.1 Plastic laminate countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.

.1 Laminate sheet: NEMA LD 3, Grade HGS, 1.2 mm nominal thickness.

.1 Manufacturers:

.1 Arborite

.2 Surface colour, pattern and finish as selected by Architect from standard range

.2 Exposed edge treatment: HPDL edge, sized to completely cover edge of panel.

.1 Colour: As selected by Architect from standard range.

.3 Fabricate in accordance with AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade.

.2 Stainless Steel Countertop: T304 Stainless Steel with #4 finish unless otherwise specified.

.1 Size: as indicated on drawings

.2 Sheet thickness: 14-gauge stainless steel

.3 Edges: standard square edge with return.

.4 Backer: 2 layers of moisture resistant plywood. 1st layer full width, 2nd layer at perimeter

.5 Provide a strippable protective coating to protect the tops during shipment and installation.

2.2 MATERIALS

.1 Particleboard for supporting substrate: ANSI A208.1 Grade 2-M-2, 20 kg/cu m minimum density; minimum 19 mm thick; join lengths using metal splines. Provide moisture resistant particleboard for countertops with sink.

.2 Adhesives: Chemical-resistant waterproof adhesive as recommended by manufacturer of materials being joined.

.3 Joint sealant: Mildew-resistant silicone sealant, colour selected by Consultant.

2.3 FABRICATION

.1 Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.

.1 Join lengths of tops using best method recommended by manufacturer.

.2 Fabricate to overhang fronts and ends of cabinets as indicated, except where top butts against cabinet or wall.

.3 Prepare cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

.2 Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.

.1 Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.

.2 Height: 100 mm, unless otherwise indicated.

.3 Solid surfacing: Fabricate tops up to 3650 mm long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

.1 Thermoform corners to shapes and sizes indicated on Drawings before seaming and joining, in accordance with manufacturer's instructions.

.2 Polish surfaces to uniform matte finish.

Part 3 Execution

3.1 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 INSTALLATION

.1 Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

.2 Attach plastic laminate countertops using screws with minimum penetration into substrate board of 16 mm.

.3 Seal joint between back/end splashes and vertical surfaces.

3.3 TOLERANCES

.1 Variation from horizontal: 3 mm in 3 m, maximum.

.2 Offset from wall, countertops: 3 mm maximum; 1.5 mm minimum.

.3 Site joints: 3 mm wide, maximum.

3.4 CLEANING

.1 Clean countertop, transaction, and vertical surfaces thoroughly.

3.5 PROTECTION

.1 Protect installed products until completion of project.

.2 Touch-up, repair or replace damaged products before Date of Substantial Performance.

END OF SECTION

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PART 1 GENERAL

1.1 SUMMARY

.1 This section includes the following:

.1 Self-rising seat, blow-molded plastic stadium chairs with armrests for installation of the following styles:

.1 Typical general fixed seat – Contoured seat and back

1.2 PERFORMANCE REQUIREMENTS

.1 General: The completed stadium chair installation shall provide the following minimum performance requirements:

.1 Plastic components: Exterior grade plastics with UV inhibitors to prevent chalking, crazing, and color change.

.2 Paint systems: Suitable for outdoor exposure.

.3 Mechanical fastening devices: Non-corrosive materials.

.4 Seat hinge assemblies: Non-corrosive materials.

.5 Fasteners: Threaded except for mounting number plates. Threaded fastener engagement shall be into threaded metal.

.6 Seat hinge assembly shall raise, without assistance, the seat pan to within one inch plus or minus of the end of the armrest.

.7 Easy Access Chair: Provide end standard with hinged armrest to allow access to the chair from the side.

.1 Height of armrest: Match fixed stadium chairs.

.2 Quantity: Equal to five percent of aisle seats (Final locations to be approved by Architect).

.8 Seating envelope: Comply with clear aisle access way width requirements of NFPA 101, Life Safety Code, Chapter entitled, “New Assembly Occupancies.”

.9 Install as many chairs as possible to fill each row in each seating section, but no less than indicated on the Architectural Drawings.

1.3 SUBMITTALS

.1 Required With the Bid

.1 Base bids on chair quantities included in the Chair Summary included on the Drawings.

.2 Provide Unit Prices for each chair type and size, complete with all accessories, including removable stretcher mounted chairs.

.1 Unit Prices will be used to adjust the Contract Sum for adjustments to the quantities indicated in the Chair Summary.

.3 Provide copies of the manufacturer’s written warranty.

.4 Product Literature for each type of chair proposed, including standard specifications for exterior treatments for cast iron, cast aluminum, steel, and plastic.

.5 Anchor bolt information.

.2 Required After Award of Contract

.1 Product Data: Submit technical data, performance test data certified by an independent testing laboratory and product information describing durability and maintenance requirements as applicable for the following items:

.1 Anchor bolts

.2 Chair assembly.

.3 Plastic materials and additives.

.4 Padding and upholstery.

.5 Coating materials, and application procedures.

.6 Armrests and cup holders

.7 Stanchion logos.

.8 Aisle lighting.

.2 Shop Drawings: Provide the following drawings

.1 Complete seating bowl with tread and riser mounting details and aisle locations

.1 Show joints between precast treads and risers and attachments.

.2 Show locations of wheelchair companion seating.

.3 Show easy access chairs.

.2 Hinged armrest for Easy-Access chair end standards.

.3 Low riser height mounting bracket, if required.

.4 Seat and back design.

.5 Seat assembly.

.6 Seat and row identification graphics.

.7 Seat attachment at unique conditions such as angled corners and where chairs span across a control or expansion joint.

.8 Integral aisle lighting locations.

.3 Seating Chart: Submit a seating chart that shows the total quantity of seats, seat widths, aisle widths, and mounting conditions. Each chair shall be represented by a rectangle.

.4 Samples: Submit custom color samples to match the Architect's color sample for the selection of colors for plastic components and ferrous or non-ferrous metal components.

.5 Maintenance instructions and inspection guidelines furnished for each chair model specified.

1.4 QUALITY ASSURANCE

.1 Life Safety: The seating layout and installation shall comply with the requirements of the NFPA 101 Life Safety Code.

.2 Seat Widths: A minimum seat width of 20 inches shall be used for spacing, unless a wider minimum is indicated on the Contract Documents.

.1 Seat widths shall be adjusted within a row so that the end standards are in general alignment with one row to another, whether aisles are of constant or configuring widths.

.1 Minimum width of General fixed seat shall be 20 inches.

.2 Quantity of Seats: The manufacturer shall maximize the quantity of the seating based on row lengths, row configuration and minimum seat widths shown in the Contract Documents.

.1 Changes to the base bid quantity shall be made by Change Order based on the unit prices provided with the Bid.

.3 "Easy Access Chair" seating, evenly distributed throughout the seating bowl, shall be understood to mean stadium chair with an armrest design that complies with applicable requirements of the American with Disabilities Act and the Performance Requirements of this Section. Provide each chair with universal symbol of access.

.4 Testing: Determine resistance of seat to deformation when loaded in accordance with the requirements of ANSI-BIFMA Seat Impact Test, modified to analyze front and back of seat.

.5 Materials (Flammability) shall satisfy applicable test, codes, standards, or requirements as follows and any requirements by Authorities Having Jurisdiction:

.1 Polyethylene shall meet the Federal Motor Vehicle Standard No. 302 which specifies a burning rate of less than 4 inches per minute.

.2 Upholstery materials shall meet requirements set forth in the State of California Bureau of Home Furnishings Technical Bulletin No. 117.

.3 Fire-Performance Characteristics of Seat Padding: Provide chairs that comply with test method included in California Technical Bulletin 117.

.4 Cushioning and padding shall be self extinguishing as defined in the requirements as set forth in the State of California Bureau of Home Furnishings Technical Bulletin No. 117.

.5 Full Scale Fire Performance Characteristics of Finished Chair: If required by authorities having jurisdiction provide chair that complies with State of California Technical Bulletin No. 133.

.6 Pre-Installation Conference: Prior to commencing the chair installation meet at the project site to review the installation.

.7 Single Source Responsibility: Stadium chairs shall be provided by a single manufacturer.

1.5 WARRANTY

.1 General: The warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor, Installer, or Manufacturer, under the Contract Documents.

.2 Warranty: Provide warranty signed by an officer of the chair manufacturer that provides for repair, replacement, or both, of stadium chairs and components found to be defective in appearance or unusable due to defects in performance. Warranty shall provide for materials and labor.

.1 General Warranty Period: 12 months after the Date of Substantial Completion.

.2 Special Warranties: Provide the following special warranties:

.1 Structural Chair Components: 10-year period against failure of the base material.

.2 Operating Hinge mechanisms: 5-year period against failure of the hinge to provide for automatic rising.

.3 Painted components: 10-year period against color change, beyond normal use. Deterioration of metals due to corrosion resulting from physical damage to the paint finish, after acceptance by Owner, is not covered by the warranty.

.4 Plastic Components: 3-year period against cracking, crazing, or other failure of backs and seats, and color change.

.3 Color Change Criteria: Failure of factory-applied or integral finishes will be measured in accordance with the following:

.1 Finish: Deterioration includes, but is not limited to, the following:

.1 Color fading more than 5 units ΔE (Hunter) when tested according to D 2244.

.2 Loss of gloss at a minimum of 50 percent of the original as measured in accordance with ASTM D 523 using 60 degree readings;

.3 Chalking in excess of a No. 8 rating for colors and No. 6 ratings for whites as illustrated in the ASTM D 4214, Test Method A.

.4 Cracking, checking, peeling, or failure of paint to adhere to bare metal.

.2 Refinish or replace materials that show evidence of deterioration of factory-applied or integral finishes within specified warranty period.

1.6 SCHEDULING

.1 Coordinate Work of this Section with the construction of the seating bowl precast concrete and installation of handrails and guardrails.

.2 Provide detailed schedule in Critical Path Method (CPM) for fabrication and installation of chairs. Include decision dates for input to manufacturer on seat and row identification numbers, and completion of supporting construction.

1.7 DELIVERY STORAGE AND HANDLING

.1 Deliver chair components in manufacturer's unopened cartons clearly labeled with manufacturer's name and contents of cartons.

.2 Packaging and shipping methods shall prevent painted chair standards from coming in contact with each other as well as other painted metal components by utilizing protective covering over each component. Maintain the protective covering on each metal component until after metal component is installed. Coating failures resulting from improper packaging, shipping, and handling during installation shall be repaired or replaced prior to installing plastic components. Protect chair units from physical damage and abuse by other trades. Replace damaged units.

1.8 PROJECT CONDITIONS

.1 Environmental Limitations: Do not install interior suite or club chairs until spaces are enclosed and weathertight; wet work in space is complete and dry; finishes, including painting, are complete; and work above ceilings is complete. Do not install chairs until ambient temperature and humidity conditions are continuously maintained at the levels anticipated for final occupancy.

.2 Field Measurements: Verify chair layout by field measurements before chair fabrication and indicate measurements on Seating Chart. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.9 MAINTENANCE

.1 Maintenance Manuals: Provide maintenance manuals that describe procedures for the cleaning and service of the stadium chairs. Include replacement part numbers and procedures for replacement.

.2 Extra Stock: Provide the following chair components that are manufactured from the same lot as the installed components. Prorate quantities among chair sizes, types and colors furnished.

.1 Seats: 2%

.2 Backs: 2%

.3 Center Standards: 2%

.4 End Standards: 2%

.5 Cup Holders: 2%

.6 Hinge Components: 2%

.7 Fasteners and mounting hardware: 10%

.8 Easy access armrest: 2%

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

.1 Manufacturers: The following manufacturers are acceptable subject to complying with the specified requirements:

.1 Irwin Seating (basis of design)

2.2 MATERIALS

.1 Anchor Bolts: The Chair Manufacturer shall provide stainless steel expansion or chemical anchor bolts for mounting riser and tread mounted chairs. The Chair Manufacturer shall provide all necessary materials for a complete seating installation.

.2 Plastic Components: Plastic seat and back components shall be double-wall construction, high density polyethylene plastic formulated with ultra-violet inhibitors to minimize chalking and fading of the finish colors. Surface finish shall be manufacturer's standard textured finish.

.3 Steel Shapes, Plates, and Sheet Metal: ASTM A 36/A 36M and galvanized in accordance with ASTM A 123/A 123M; coated as specified for chair standards.

.4 Standards: floor mounting is required. Provide manufacturer's "low riser" unit if required to accommodate concrete substrate anchorage.

.1 Provide manufacturer's standard cast iron or cast aluminum design.

.2 If required, provide coated galvanized steel transfer plate to accommodate concrete substrate anchorage.

.5 Hinge Mechanism: Provide automatic lifting of the seat to a 3/4 fold position, allowing for manually lifting the seat to a full fold position regardless of stadium chair design.

.1 Provide manufacturer's standard cast iron hinge arm design.

.2 Hinge mechanism shall perform to the requirements of ASTM F 851, Test Method for Self-Rising Seat Mechanisms plus the performance requirements required by this specification section.

.6 Cup Holders: Manufacturers of cup holders include Caddy Products and Cy Young Industries.

.1 Mount cup holders to the backs of stadium chairs except upper-level seating.

.2 Mount cup holders to rails in the front row and in front of wheelchair seating areas.

.1 Provide one rail mounted cup holder for each companion seat and one for each wheelchair space.

.3 Provide integral cup holders and armrest caps for stadium chairs in front rows of seating levels.

.4 Color of cup holder shall match the color of the standards.

2.3 SPECTATOR BOWL SEATING

.1 Basis of Design: Irwin Patriot 30.52.00.30 or equivalent.

2.4 FINISHES

.1 Plastic Component Color: Two as selected by Architect

.2 Standards, seat arms and related cast iron, cast aluminum, or ferrous metal components: Factory applied coating as follows:

.1 Surface Preparation: Grit blasting and washing process, in addition to special surface preparation treatments that are standard to the manufacturer.

.2 Pretreatment: Manufacturer's standard multi-stage bonderization process.

.3 Primer: Manufacturer's standard electrodeposition epoxy primer.

.4 Finish Coating: Thermosetting fluorocarbon powder coatings containing not less than 70 percent fluorocarbon resin.

.5 Colors of Standards: As selected by Architect.

.3 Cast Iron Finish: The cured film shall meet the following performance requirements:

.1 Impact Resistance: 120 foot-pounds per ASTM D 2794.

.2 Reverse Impact: 100 foot-pounds per ASTM D 2794

.3 Crosshatch Adhesion: No loss (Rating 5B) per ASTM D 3359B.

.4 Salt Spray Resistance: Any perceived blistering, cracking or de-lamination at no less than a 7 rating after 1500 hours of exposure per ASTM B 117.

.5 Humidity Resistance: No blistering, cracking, or delamination after 1500 hours of exposure per ASTM D 2247.

.6 UV Resistance: No blistering, cracking, delamination, or chalking after 10 years South Florida or 2800MJ EMMAQUA test.

.7 Pencil Hardness: Minimum rating of 2H per ASTM D 3363.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Examine substrates and conditions with Installer and Chair manufacturer present for compliance with requirements for construction tolerances and resultant impact on anchors, fasteners, and alignment. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 General: Install stadium chairs in locations indicated and fasten securely to substrates according to manufacturer's recommendations and approved submittals.

.1 Use installation methods and fasteners that produce fixed audience seating assemblies with individual chairs capable of supporting an evenly distributed 600-lb static load without failure or other conditions that might impair the chair's usefulness.

.2 Install seating with chair ends aligned from first to last row and with backs and seats varied in width to optimize sightlines.

.3 Install riser-mounted attachments to maintain uniform chair heights above floor and to ensure level alignment of chair backs.

.1 Anchors: Tread and riser mounted standards shall be attached to the substrates with the appropriate anchors. Ends of anchors shall not protrude from the face of nut any more than 3/8 inch. Trim anchors as necessary and provide a finished end with no burrs or sharp edges.

.4 Install seating so moving components operate smoothly and quietly.

.5 Fasteners: Seats and backs shall be connected to hinge mechanisms and chair standards using screws of sufficient length for attachment, but not protruding from face of nut any more than 1/8 inch. Provide a finished end with no burrs or sharp edges.

3.3 ADJUSTMENT AND CLEANING

.1 Adjust chair backs so that they are aligned in row.

.2 Adjust self-rising seat mechanisms to align seats in each row when in upright position.

.3 Verify that All components and devices are operating properly

.4 Before final inspection, thoroughly clean stadium chairs using the manufacturer's recommended procedure.

.5 Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.

.6 Replace upholstery fabric and padding damaged during installation.

3.4 FIELD QUALITY CONTROL

.1 Manufacturer or its assigned agent shall provide supervision of the Work and perform field inspection prior to request for final punchlist.

.1 Correct identified defects or irregularities.

END OF SECTION