P&R

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SPECIFICATIONS

SURGENOR TRUCK CENTRE ADDITION & RENOVATIONS

1571 LIVERPOOL COURT,
OTTAWA, ONTARIO.
K1B 4L1.

VOLUME 1 OF 2

TENDER

SPECIFICATION FOR

SURGENOR TRUCK CENTRE
1571 LIVERPOOL COURT, OTTAWA, ONTARIO. K1B 4L1.

BY

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JANUARY 2019

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E-5 Electrical: Second Floor - Power And Systems
E-6 Electrical: Service Addition - Systems
E-7 Electrical: Storage Building - Systems
E-8 Electrical: Details
E-9 Electrical: Details And Panel Schedules

END OF SECTION

.1
General Information

.1 The project includes an addition of approximately 200m² and renovations to a two storey automobile dealership, a separate Storage Building and associated site work. Refer to Drawings for phasing of the work.

.2 Work at the site is expected to commence by 15 April 2019. Final Occupancy is required by 15 November 2019. Refer to Drawings for phasing of the Work.

.3 Major Phase Milestones:
- .1 Phase 1:
  - .1 Start 15 April 2019
- .2 Phase 2:
  - .1 Start 15 July 2019
  - .2 Partial Occupancy of 1 storey addition and new storage building by 1 September 2019.
- .3 Phase 3:
  - .1 Start 15 September 2019
  - .2 Final occupancy of all work by 15 November 2019.

2.
Inquiries

.1 Direct all inquiries to the Project Architect, Pye & Richards Architects Inc., 200-824 Meath Street, Ottawa, Ontario, K1Z 6E8, telephone (613) 724-7700, facsimile (613) 724-1289. E-mail: info@pnrarch.com.

3.
Tender Documents

.1 Tender documents include the following:
ALL TENDERERS ARE STRONGLY URGED TO READ AND CONSIDER THESE DOCUMENTS CAREFULLY
- .1 Instructions to Tenderers, Section 00 21 00.
- .2 Tender Form, Section 00 41 00.
- .3 Supplements to Tender Form, Sections 00 43 22 and 00 43 36.
- .4 Form of Agreement, Definitions, and General Conditions, CCDC 2 (2008) - Stipulated Price Contract.
- .5 Amendments to the Agreement, and Supplemental Definitions, Section 00 50 00.
- .6 Supplementary Conditions, Section 00 73 00.
- .7 Addenda issued during the Tender Period.
- .8 Drawings and specifications prepared by Pye & Richards Architects Inc., Cunliffe & Associates, Capital Engineering Group, and McKee Engineering, and listed in Specification Index, Section 00 01 10 and List of Drawings, Section 00 01 15.

4.
Availability of
Tender Documents

.1 Invited general contractors may obtain sets of tender documents via our box.com account. One(1) set of hard copies will also be available at the office of the Architect, at no cost.

5.
Delivery and
Identification of Tenders

.1 Submit unqualified tenders, on forms provided, under seal in closed opaque envelope to:
DanPat Limited.
Surgenor Truck Centre
1571 Liverpool Court,
Ottawa, Ontario.
K1B 4L1
Attn: Andrew McGurn
President

.2 Clearly identify on the front of the envelope:
.1 Name and legal address for notices of Bidder.
.2 Title of work Tender: "Surgenor Truck Centre Addition & Renovations".
.3 Tenders to be delivered not later than 3:00:00 P.M. LOCAL TIME ON Thursday 7 February 2019. Late submissions will be disqualified and returned unopened.

.4 TENDERER TO ENCLOSE ONE COPY OF THE FOLLOWING: duly completed with all blank spaces filled in, and with the total tender price in both words and figures:
.1 TENDER FORM (Section 00 41 00)
.2 TENDER SECURITY
.3 AGREEMENT TO BOND
.4 UNIT PRICES FORM (Section 00 43 22)
.5 Within 24 hours of tender closing, lowest tenderer shall submit the following, duly completed, to the office of the Architect: (faxed submissions acceptable, provided corresponding original submitted within 1 working day thereafter). Other tenders shall submit within 24 hours of request.
.1 Proposed Subcontractors Form (Section 00 43 36).
.2 Proof of Good Standing with Workplace Safety & Insurance Board.

.5 Within 48 hours of tender closing, lowest tenderer shall submit the following to the office of the Architect. Other tenderers shall submit within 48 hours of request.
.1 Workplace Safety & Insurance Board CAD-7 Form.

6.
Signing, Sealing and Witnessing of Tender Form

.1 Sole Partnership:
Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under signature. Affix seal.

.2 Partnership:
Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" against each signature. Affix seal against each signature.

.3 Limited Company:
.1 Signature of all duly authorized signing officers in their normal signatures. Insert the officer's capacity in which the signing officer acts against each signature. Affix the Corporate Seal.
.2 If the tender is signed by officials other than the president or secretary of the company, or the president-secretary- treasurer of the company, a copy of the by-law resolution of the Board of Directors authorizing them to do so must also be submitted with the tender in the tender envelope.

7.
Amendments of Tenders Prior to Closing

.1 Tender submitted in accordance with these instructions may be revised by letter, provided the revision is received prior to the tender closing date. Facsimiled, e-mailed, and telegraphed revisions submissions not acceptable.

.2 Tenders may be withdrawn at any time prior to the closing date and time, provided the Owner receives notification in writing.

8.
Informal Tenders

.1 Tenders which are unsigned, unsealed, incomplete, conditional or obscure, or which contain additions not called for, reservations, erasures, alterations of any kind will be deemed “Informal”. Owner reserves the right to reject such tenders.

.2 Owner reserves the right to waive minor tender irregularities.

9.

Opening of Tenders

.1 Tenders will be opened in private.

.2 The lowest or any tender will not necessarily be accepted in particular, if only one tender is received.

.3 Owner reserves the right to accept or reject any part of a tender submission and/or not to award a contract.

.4 Tenderers will not be accepted from tenderers who do not acknowledge, on the tender form, receipt of all issued addenda.

.5 Owner will not be responsible for any liabilities, costs, expenses, loss or damage incurred, sustained or suffered by any tenderer prior to, or subsequent to, or by reason of acceptance of, or non-acceptance of, a tender. Owner reserves the right to reject any or all tenders, and to waive formalities as the interests of the Owner may require.

.6 The Owner may award the contract any time within the thirty (30) day period from tender closing.

10.
Tender Security

.1 Each tender must be accompanied by a tender security deposit in the amount of not less than ten percent (10%) of the tender sum. Such security may be in any of the following forms and made out in favour of the Owner:

.1 A bid bond in the approved Canadian Construction Form (CCDC 220 2008) for a period of thirty (30) days and issued by a Surety Company satisfactory to the Owner.

.2 A certified cheque made payable to the Surgenor national Leasing Ltd. and drawn on a recognized financial institution in Canada.

.3 A bank draft from a recognized financial institution in Canada.

.2 All bid securities must be completely executed original documents. Photocopies of documents, signatures or corporate seals will not be accepted.

.3 Security may be retained without interest by the Owner until a contract is entered into and performance bond and payment bonds satisfactory to the Owner have been provided or thirty (30) days from tender opening, which ever comes first.

.4 Each tenderer understands and agrees that, if their tender is withdrawn before the Owner shall have considered tenders or before the tenderer has been notified that their tender has been accepted by the Owner, or if the tenderer fails for any

reason to execute the Agreement and provide other documents as specified herein, the Owner may retain any tender deposit for the use of the Owner.

11.
Agreement to Bond

.1 Tenderers shall also include with the tender, a letter from a Surety Company satisfactory to the Owner that the Bidder will be covered by a 50% Performance Bond and a 50% Labour and Material Payment Bond as required under General Conditions if successful in being awarded this contract.

12.
Bid Depository

.1 The Ottawa Valley Bid Depository will not be used for this tender.

13.
Bonds

.1 A Performance Bond in an amount equal to fifty (50) percent of the tender sum, and a Labour and Material Payment Bond in an amount equal to fifty (50) percent of the tender sum, with a Guarantee and Surety Company, satisfactory to the Owner, authorized to carry on business in the Province of Ontario, will be required for faithful performance of the Contract.

.2 Bonds shall conform to the requirements of GC 11.2 and relevant Supplementary Conditions.

14.
Proposed Subcontractors

.1 Tenderers shall identify the name of proposed Subcontractors used in making up the tender. Only one Subcontractor to be named for each part of work to be sublet.
.1 Where indicated, major Subcontractors shall be identified in the Tender Form.
.2 Other major Subcontractors shall be specifically identified in Section 00 43 36 - Proposed Subcontractors Form.
.3 Mechanical and Electrical sub-Subcontractors shall be specifically indicated.

.2 Use only Subcontractors you have ascertained to be capable of executing the work to the kind and quality specified and within the time and other limitations required.

.3 The Contractor will not be allowed to substitute other Subcontractors in place of those named in the tender without written approval from the Architect.

.4 Where terms such as "Own Forces" are used, submission must include documented evidence that the contractor possesses the staff, equipment, and skills to undertake such work.

.5 The Owner reserves the right of refusal on any Subcontractor.

15. Unit Prices

.1 Tenders shall provide unit prices for additions and deletions to quantity of work as indicated in Supplemental Tender Form (Unit Prices Form - Section 00 43 22).

16. Examination of Documents and Site

.1 Each tenderer must examine the plans, specifications and reports and visit the site of the work before submitting a tender, and must satisfy themselves by personal examination as to the local conditions to be met with during the construction and conduct of the work. Tenderers shall make their own estimate of the facilities and difficulties to be encountered in completing the work under the contract. Tenderers are not to claim at any time after submission of this tender that there was any misunderstanding of the terms and conditions of the Contract relating to the site conditions.

.2 No plea for ignorance of conditions that exist or that may hereafter exist or of conditions or difficulties that may be encountered in the execution of the work under this contract as a result of failure to make the necessary examinations and investigations will be accepted as an excuse for any failure or omission on the part of the contractor to fulfil in every detail all the requirements of the said contract documents, or will be accepted as a basis for any claims whatsoever for extra compensation or any extension of time.

17. Building & Other Permits

.1 The Contractor shall apply for, obtain and pay for any and all permits, fees, bonds etc., required by any authority having jurisdiction over the works except as otherwise noted.

.2 The Owner has applied and paid for the Building Permit on 4 December 2018. The Owner will obtain the Building Permit.

18. Questions and Addenda

.1 If a tenderer is in doubt about the meaning or intent of any part of the tender documents, or if a tenderer finds a discrepancy,

omission, or ambiguity, the tenderer shall submit questions to the Architect in writing at least ten (10) working days prior to the closing of tenders.

.2 Neither the Owner, nor the Architect will be responsible for any oral instructions given to tenderers which have not been confirmed in writing.

.3 If the Architect, or Owner should deem it necessary to clarify or amend any term in the tender, a written addendum will be sent to each tenderer. The tenderer shall consider the addendum as an integral part of the tender documents. Changes to the tender documents shall be communicated to the tenderers in the form of addenda.

.4 If no questions are received it will be assumed that the work is clearly defined, that tenderers are in no doubt as to the meaning or intent of tender documents.

.5 Oral questions may be considered up to 3 hours prior to tender closing.

19.
Substitutions

.1 Manufacturers who consider their product as equal to those specified may make written application to the Architect during the tendering period. Attach duplicate copies of full explanatory technical data pertinent to the products of the application together with a list of projects on which they have been used in the last two years. Make application as early as possible in the tendering period and not later than ten (10) working days before the closing of tenders. If the product is approved as equivalent to that specified, an addendum will be issued to name the approved product. Cost of additional work and modifications to the design due to use of alternatives shall be borne by the Contractor.

.2 Where the words "or approved equivalent" and "or equal" occur in the specifications, they mean "approved as equivalent in the opinion of the Architect" and "equal in the opinion of the Architect" respectively.

.3 Where products specified are referred to by trade name, the Owner will not accept tenders from any other manufacturer or agents of such other manufacturers whose products have not been specified by name in the specifications or in addenda issued during the tendering period.

.4 A number of manufacturers have been approved as equivalent for the various elements in the specifications. If any approved

firm finds it impossible to comply with all parts of the drawings and specifications, the tenderer shall notify Architect in writing not later than ten (10) working days before closing of tender. Cost of additional work and modifications to the design due to use of products which do not comply, shall be borne by the Contractor.

20.
Value Added Taxes

.1 The Harmonized Sales Tax (HST) is NOT to be considered applicable taxes for the purposes of this bid. The bidder shall therefore NOT include in his tender sum the said HST. The successful Contractor shall indicate on each application for payment as a separate amount the HST the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract.

21.
Occupational Health and Safety Act

.1 For purposes of the Occupational Health and Safety Act the Contractor for this project will be designated the "Constructor", and will assume the responsibilities of the constructor as set out in that Act and its Regulations.

.2 Prior to tender award, submit on company letterhead, in a form satisfactory to Owner, a letter both signed and sealed, accepting tenderer's role as the "Constructor" for all sub-contractor's and sub-trades as well as contractors whose contracts may be separately signed and agreed upon with the Owner.

.3 Owner will submit other Contractor's WSIB Clearance Certificates and CAD-7 forms to Contractor prior to other contractors commencing work on the site.

22.
Invited General Contractors

.1 Tenders will be accepted from the following General Contractors invited by the Owner:

- Dolyn Developments 613-224-7268
- McDonald Bros. Construction Ltd. 613-831-6223
- Tal-Co Building Innovations Ltd. 613-821-3959
- Warlyn Construction Inc. 613-729-8300
- Tofcon Construction Inc. 613-224-3714
- M. D. Ford Construction Inc. 613-742-8338

24.

Site Tour

.1 A site tour will be held on 24th January 2019 at the site at 10:00.am. Tour will commence at the main entrance of the existing building.

END OF SECTION

1.

Soils Report

.1 Subsurface investigation report is attached.

.2 Report is Project # 62788.04 dated 4 December 2018, as prepared by GEMTEC Consulting Engineers and Scientists Limited.

.3 Neither the Architect nor the Owner offer a warranty to the Contractor that this information is representative of the conditions prevailing on site.

END OF SECTION

GEMTEC
www.gemtec.ca

Geotechnical Investigation
Surgenor Truck Centre
1571 Liverpool Court
Ottawa, Ontario

experience • knowledge • integrity expérience • connaissance • intégrité

GEMTEC
www.gemtec.ca

Submitted to:

Surgenor Truck Centre
c/o Pye & Richards Architects Inc.
200 – 824 Meath Street
Ottawa, ON
K1Z 6E8

Geotechnical Investigation
Surgenor Truck Centre
1571 Liverpool Court
Ottawa, Ontario

December 04, 2018
Project: 62788.04

experience • knowledge • integrity

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Ottawa, ON, Canada
K2K 2A9

December 04, 2018

File: 62788.04

Surgenor Truck Centre
c/o Pye & Richards Architects Inc.
200 - 824 Meath Street
Ottawa, Ontario
K1Z 6E8

Attention: Dave Mungall

Re: Geotechnical Investigation Report, Surgenor Truck Centre Renovation, 1571 Liverpool Court, Ottawa, Ontario

Please find enclosed our final geotechnical investigation report for the above noted project based on the scope of work provided in our proposal dated June 5, 2018. This report was prepared by Mr. Joseph Berkers, and reviewed by Mr. John Cholewa, Ph.D., P.Eng.

Do not hesitate to contact the undersigned if you have any questions or require additional information.

Joseph Berkers

John Cholewa, Ph.D., P.Eng.

JB/JC

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1.0 INTRODUCTION

This report presents the results of a subsurface investigation carried out for the proposed renovations of Surgenor Truck Centre at 1571 Liverpool Court, Ottawa, Ontario. The purpose of the investigation was to identify the general subsurface conditions at the site by means of a limited number of boreholes and, based on the factual information obtained, to provide engineering guidelines on the geotechnical design aspects of the project, including construction considerations that could influence design decisions.

The subsurface investigation was carried out in general accordance with our proposal dated June 5, 2018.

2.0 BACKGROUND

2.1 Project Description

It is understood that consideration is being given to renovations of Surgenor Truck Centre, located at 1571 Liverpool Court. The proposed renovations include a wash bay in the southeast corner, an addition to the west side of the existing building, and a detached storage building located northwest of the existing building. The areas surrounding the existing building and within the vicinity of the proposed additions are currently either gravel or asphalt covered and relatively flat and accessible.

2.2 Review of Geology Maps

Based on historical geological mapping, the overburden deposits within the vicinity of the site generally consists of a very stony sand or sandy loam glacial till material. Fill is also anticipated within the upper subsurface layers (i.e., directly beneath the existing pavement structure).

3.0 SUBSURFACE INVESTIGATION

The field work for the borehole investigation was carried out on August 8, 2018. During that time, six (6) boreholes, numbered 18-1 to 18-6, were advanced around the perimeter of the proposed building using a truck mounted drill rig supplied and operated by George Downing Estate Drilling Ltd. The boreholes were advanced to depths between approximately 1.5 and 4.6 metres below ground surface level.

Standard penetration tests were carried out in the boreholes 18-2 to 18-6 at regular intervals of depth and samples of the soils encountered were recovered using a 50 millimetre diameter split barrel sampler. The field work was supervised throughout by a member of our engineering staff.

Following completion of the drilling, the soil samples were returned to our laboratory for examination by a geotechnical engineer. Two soil samples were sent away for basic chemical testing relating to corrosion of buried concrete and steel.

The results of the boreholes are provided on the Record of Borehole sheets in Appendix A. The locations of the boreholes are shown on the Borehole Location Plan, Figure 2.

The borehole locations were selected by GEMTEC Consulting Engineers and Scientists Limited personnel. The ground surface elevations at the location of the boreholes were determined using a Trimble R10 global positioning system. The elevations are referenced to geodetic datum and are considered to be accurate within the tolerance of the instrument.

4.0 SUBSURFACE CONDITIONS

4.1 General

The soil and groundwater conditions logged in the boreholes are given on the Record of Borehole sheets in Appendix A. The borehole logs indicate the subsurface conditions at the specific test locations only. Boundaries between zones on the logs are often not distinct, but rather are transitional and have been interpreted. Subsurface conditions at other than the borehole locations may vary from the conditions encountered in the boreholes. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves judgement and GEMTEC does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice.

The following presents an overview of the subsurface conditions encountered in the boreholes advanced during this investigation.

All laboratory testing results will be provided in the final report.

4.2 Existing Granular Pavement Structure

All of the boreholes, except for borehole 18-3, encountered a 40 to 100 millimetre thick layer of asphaltic concrete overlying a layer of base/subbase material, varying in thickness from 200 to 640 millimetres. The base/subbase material encountered can generally be described as brown sand and gravel.

The result of a grain size distribution test carried out on a sample of base material is provided in Appendix B.

4.3 Fill Material

Fill material, having a thickness of between 0.3 and 1.5 metres, was encountered below the existing pavement structure at all borehole locations. The fill material is generally composed of greyish brown, brown, dark brown, and black sand and gravel, gravelly sand, sand, silty sand, and silty clay.

Standard penetration tests (SPT) carried out in the fill material gave N values ranging from 3 to greater than 50 blows per 0.3 metres of penetration, which reflect a variable very loose to very dense relative density of the granular fill.

The result of a grain size distribution test carried out on a sample of fill material is provided in Appendix B.

4.4 Silt and Sandy Silt

Deposits of silt and sandy silt were encountered in boreholes 18-2 and 18-3 at depths of 0.6 metres and 0.7 metres, respectively. At boreholes 18-2 and 18-3, the thickness of the silt and sandy silt deposits was found to be 0.9 and 0.7 metres, respectively. Two standard penetration tests within these layers gave N values of 7 and 8, indicating a loose relatively density.

The result of a grain size distribution test carried out on a sample of the native deposits is provided in Appendix B.

4.5 Glacial Till

Deposits of glacial till were encountered in boreholes 18-2 to 18-6 at a depth ranging from 0.8 to 2.1 metres below ground level. The glacial till can generally be described as grey brown silty sand with variable amounts of gravel and probable cobbles and boulders.

Standard penetration tests carried out in the glacial till gave N values ranging from 10 to greater than 50 blows per 0.3 metres of penetration, which reflect a variable loose to very dense relative density. Greater than 50 blows for less than 0.3 metres of penetration may also reflect the presence of cobbles and boulders within the glacial till.

4.6 Inferred Bedrock

Practical auger refusal occurred in all of the boreholes, except for borehole 18-1, which was terminated at its target depth of 1.5 metres. In boreholes 18-2 to 18-6, auger refusal occurred at depths ranging from 3.1 to 4.6 metres.

These auger refusal depths represent the inferred bedrock level; however, it should be noted that practical auger refusal can sometimes occur within cobbles and boulders and may not necessarily be representative of the upper surface of the bedrock.

4.7 Groundwater Levels

During drilling, groundwater was observed in boreholes 18-3 and 18-5 at depths of 2.9 and 3.5 metres below ground level, respectively. The remaining boreholes were all observed to be dry upon completion of drilling.

Note that the groundwater levels observed during drilling may not accurately represent the actual level of the groundwater table. Also, the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

4.8 Soil Chemistry Relating to Corrosion

The results of chemical testing on soil samples recovered from boreholes 18-4 and 18-6 are provided in Appendix C and summarized in Table 4.1.

Table 4.1 – Summary of Corrosion Testing

Parameter	Borehole 18-4 (Sample 3)	Borehole 18-6 (Sample 3)
Conductivity (µS/cm)	136	641
pH	7.69	7.72
Sulphate Content (µg/g)	18	620

5.0 RECOMMENDATIONS AND GUIDELINES

5.1 General

The information in the following sections is provided for the guidance of the design engineers and is intended for the design of this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety, and equipment capabilities.

The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible surface and/or subsurface contamination resulting from previous uses or activities of this site or adjacent properties, and/or resulting from the introduction onto the site from materials from off-site sources are outside the terms of reference for this report.

5.2 Proposed Renovations

5.2.1 Excavation

The excavation for the footings of the proposed building extensions and detached storage building will be carried out mostly through the asphalt, granular pavement material, fill material, and glacial till. The sides of the excavation in overburden should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act. According to the Act, the fill material at this site can be classified as Type 3 soil and, accordingly, allowance should be made for excavation side slopes of 1 horizontal to 1 vertical, or flatter.

In the event that a granular pad is necessary for the strip footings, the excavations should be sized to accommodate a pad of imported granular material which extends at least 0.3 metres horizontally beyond the edge of the footings and down and out from this point at 1 horizontal to 1 vertical, or flatter.

Groundwater inflow, if any, from the overburden deposits should be relatively small and controlled by pumping from filtered sumps within the excavation. It is not expected that short term pumping during excavation will have a significant effect on nearby structures and services.

5.2.2 Footing Design

Based on the results of the current investigation, the proposed structure could be founded on footings bearing on or within native, undisturbed silt/sand, or glacial till. The fill material is considered to be variable and compressible and should be removed from below the foundations and slabs on grade.

In areas where subexcavation of disturbed material or fill is required below proposed founding level, the grade could be raised with compacted granular material (engineered fill). The engineered fill should consist of granular material meeting Ontario Provincial Standard Specifications (OPSS) requirements for Granular B Type II and should be compacted in maximum 200 millimetre thick lifts to at least 95 percent of the standard Proctor maximum dry density. To provide adequate spread of load beneath the footings, the engineered fill should extend horizontally at least 0.3 metres beyond the footings and then down and out from this point at 1 horizontal to 1 vertical, or flatter. The excavations for the foundation should be sized to accommodate this fill placement.

For design purposes, footings bearing on the native, undisturbed glacial till material, or on a pad of engineered fill above native, undisturbed soil should be sized using a geotechnical reaction at Serviceability Limit State (SLS) of 150 kilopascals and a factored geotechnical resistance at Ultimate Limit State (ULS) of 300 kilopascals. For footings bearing directly on the native, undisturbed silt and sandy silt a geotechnical reaction at SLS of 90 kilopascals and a factored geotechnical resistance at ULS of 250 kilopascals could be used. The post construction total and differential settlement of the footings at SLS should be less than 25 millimetres, provided that all loose or disturbed soil is removed from the bearing surfaces.

To reduce the potential for cracking in the footings, foundation walls, and concrete slabs on grade where the footings transition between different subgrade materials, the foundation walls should be reinforced for a distance of 3 metres on both sides of the transition areas or as recommended by the structural engineer.

5.2.3 Seismic Design of Proposed Structures

Based on the results of the investigation, the proposed structure should be designed for seismic Site Class C.

There is no potential for liquefaction of the overburden deposits at this site.

5.2.4 Frost Protection of the Foundations and Slab

All exterior footings in unheated portions of the proposed extensions and detached structure should be provided with at least 1.5 metres of earth cover for frost protection purposes. Isolated, unheated exterior footings adjacent to surfaces which are cleaned of snow cover during the winter months should be provided with a minimum of 1.8 metres of earth cover. The required depth of frost protection can be reduced by the thickness of any engineered fill beneath the foundations. Alternatively, the required frost protection could be provided by means of a combination of earth cover and extruded polystyrene insulation. An insulation detail could be provided upon request.

5.2.5 Foundation Wall Backfill and Drainage

To avoid frost adhesion and possible heaving, the foundations should be backfilled with imported, free-draining, non-frost susceptible granular material such as that meeting OPSS Granular B Type I or II requirements. The existing fill material could be excavated, where required, stockpiled on site, and tested for grain size distribution to assess whether it could be reused on the site for foundation wall backfill.

Where the backfill will ultimately support areas of hard surfacing (pavement, sidewalks or other similar surfaces), the backfill should be placed in maximum 200 millimetre thick lifts and should be compacted to at least 95 percent of the standard Proctor maximum dry density value using suitable vibratory compaction equipment. Light, walk behind compaction equipment should be used next to foundation walls to avoid excessive compaction induced stress on the foundation walls. Where future landscaped areas will exist next to the proposed structure and if some settlement of the backfill is acceptable, the backfill could be compacted to at least 90 percent of the standard Proctor maximum dry density value.

Where areas of hard surfacing (pavement or pathways, etc.) abut the proposed structure, a gradual transition should be provided between those areas of hard surfacing underlain by non-frost susceptible granular wall backfill and those areas underlain by existing frost susceptible material to reduce the effects of differential frost heaving. It is suggested that granular frost tapers be constructed from 1.5 metres below finished grade to the underside of the granular subbase material for the hard surfaced areas. The frost tapers should be sloped at 1 horizontal to 1 vertical, or flatter.

Perimeter foundation drainage is not considered necessary for a slab on grade structure at this site, provided that the floor slab level is above the finished exterior ground surface level.

5.2.6 Slab on Grade Support

Based on the results of the investigation, the area of the site is generally underlain by the existing pavement structure, fill material, and native overburden deposits. The existing asphaltic concrete and base/subbase material should be removed from the slab on grade areas. The adequacy of

the existing fill material should be assessed during excavation by geotechnical personnel. However, based on the results of the boreholes, for predictable performance of the concrete slab, it is likely that the existing fill material will have to be removed from below the slabs on grade.

The grade below the concrete slabs on grade could be raised, where necessary, with granular material meeting OPSS requirements for Granular B Type I or II. The use of Granular B Type II material is preferred under wet conditions. The granular base for the proposed slab on grade should consist of at least 150 millimetres of OPSS Granular A.

All imported granular materials placed below the proposed floor slab should be compacted in maximum 200 millimetre thick lifts to at least 95 percent of the standard Proctor maximum dry density value.

Underfloor drainage is not considered necessary provided that the floor slab level is above the finished exterior ground surface level.

Thermal protection of the concrete slab on grade is required in areas that will remain unheated during the winter period. An insulation detail could be provided upon request. The type of insulation used below the slabs will depend on the stresses imposed on the insulation. The stress on the insulation should not exceed about 35 percent of the insulation's quoted compressive strength due to the time dependant creep characteristics of this material. The allowable stress levels for several strengths of insulation are provided in Table 5.1.

Table 5.1 – Allowable Stress Levels

Insulation Type	Maximum Allowable Stress (kilopascals)
Dow SM (or equivalent)	70
Dow Highload 40 (or equivalent)	95
Dow Highload 60 (or equivalent)	145
Dow Highload 100 (or equivalent)	240

If required, a modulus of subgrade reaction for the design of the concrete slabs on grade could be provided as the design progresses.

5.2.7 Corrosion of Buried Concrete and Steel

The measured sulphate concentration in the soil recovered from boreholes 18-4 and 18-6 is 18 and 620 micrograms per gram, respectively. According to Canadian Standards Association (CSA) "Concrete Materials and Methods of Concrete Construction", these concentrations of sulphate in the soil samples can be classified as low. Any concrete that will be in contact with the native soil should be batched with General Use (formerly known as Type 10 cement). The effects of freeze thaw in the presence of de-icing chemical (sodium chloride) use on the roadway/pathway should be considered in selecting the air entrainment and the concrete mix proportions for any concrete.

Based on the resistivity and pH of the soil samples recovered from boreholes 18-4 and 18-6 can be classified as non-aggressive and slightly aggressive to unprotected steel, respectively. The manufacturer of any buried steel elements that will be in contact with the soil or groundwater should be consulted to determine the durability of the product used. It is noted that the corrosivity of the groundwater could vary throughout the year due to the application of sodium chloride for de-icing.

5.3 Pavement Reinstatement and Reconstruction

It is understood that a portion of the existing pavement at the site is to be reconstructed to form an access way for fire trucks. In addition to this, some areas of the pavement will need to be reinstated due to excavations for the foundations.

For both the pavement reinstatement and reconstruction, all surficial topsoil and any soft, wet or deleterious materials should be removed. This need not include the removal of the existing fill and former topsoil provided that some minor post construction settlement of the flexible (asphaltic concrete) pavement can be accommodated.

Prior to placing granular material, the subgrade surface should be proof rolled with a large steel drum roller under dry conditions. Any soft areas should be subexcavated and replaced with compacted earth borrow. The earth borrow should match the subexcavated materials.

It is suggested that the following minimum pavement structure be used to reinstate the existing asphaltic concrete:

- 50 millimetres of Superpave 12.5 (Traffic Level B), over
- 150 millimetres of OPSS Granular A, over
- 300 millimetres of OPSS Granular B Type II (100 millimetre minus crushed stone)

For any areas which will be used by heavy trucks, including the fire truck accessway, the following pavement structure is suggested:

- 90 millimetres of Superpave 12.5 (Traffic Level B), placed in two (2) 45-millimetre-thick layers, over
- 150 millimetres of OPSS Granular A, over
- 450 millimetres of OPSS Granular B Type II (100 millimetre minus crushed stone)

Performance grade PG 58-34 asphaltic concrete should be specified.

The granular base and subbase materials should be compacted in maximum 200 millimetre thick lifts to at least 98 percent of the standard Proctor maximum dry density value.

The above pavement structure assumes that the foundation wall backfill is adequately compacted and that the subgrade surface is prepared as described in this report. If the subgrade surface is disturbed or wetted due to construction operations or precipitation, the granular thicknesses given above may not be adequate and it may be necessary to increase the thickness of the Granular B Type II subbase and/or to incorporate a woven geotextile separator between the roadway subgrade surface and the granular subbase material. The adequacy of the design pavement thickness should be assessed by geotechnical personnel at the time of construction.

5.4 Services

5.4.1 Excavation

In the overburden, the excavation for flexible service pipes should be in accordance with Ontario Provincial Standard Drawing (OPSD) 802.010 for Type 3 soil. The excavation for rigid service pipes should be in accordance with OPSD 802.031 for Type 3 soil. The sides of the excavations within overburden soils should be sloped in accordance with the requirements in Ontario Regulation 213/91 under the Occupational Health and Safety Act. According to the Act, the soils at this site can be classified as Type 3 soils. Therefore, for design purposes, allowance should be made for 1 horizontal to 1 vertical, or flatter, excavation slopes. As an alternative or where space constraints dictate, the service installations could be carried out within a tightly fitting, braced steel trench box, which is specifically designed for this purpose.

Based on the results of the boreholes, bedrock may expected at a depth as shallow as 3 meters below ground level. In the case that bedrock excavation is required for services, the excavation for flexible and rigid service pipes in bedrock could be in accordance with OPSD 802.013 and 802.033, respectively. Where required, the excavation of the bedrock can likely be carried out using large excavation equipment in conjunction with pneumatic hoe ramming equipment. Line drilling on close centres could be used to reduce, not prevent, over break and under break of the bedrock excavation and to define the limit of excavation next to existing structures and services. For the bedrock at this site, it is suggested that allowance be made for line drilling 75 to 100 millimetre diameter holes on 200 to 300 millimetre centres.

Very dense glacial till material may be expected at a depth as shallow as 1.3m below level, which is likely to affect service excavation.

Groundwater seepage into excavations is possible and should be controlled, as necessary, by pumping from within the excavations. It is not expected that short term pumping during excavation will have a significant effect on nearby structures and services.

5.4.2 Pipe Bedding

The bedding for sewers and watermains should be in accordance with OPSD 802.010 and 802.031 for flexible and rigid pipes in Type 3 soils, respectively. The bedding for flexible and rigid service pipes in bedrock should be in accordance with OPSD 802.013 and 802.033, respectively.

The bedding for service pipes should consist of at least 150 millimetres of crushed stone meeting OPSS requirements for Granular A. Cover material, from spring line to at least 300 millimetres above the tops of the pipes, should consist of granular material, such as that meeting OPSS Granular A.

Cobbles and boulders should be anticipated in the glacial till. As such, allowance should be made for removal of boulders from the glacial till during excavation. In order to advance a trench box, even boulders that partially intrude into the sides of the excavation must be removed, which may result in a wider excavation than anticipated. Further, additional backfill and bedding material may be required to fill any voids left from the removal of boulders.

In areas where the subsoil is disturbed or where unsuitable material (fill or organic material) exists below the pipe subgrade level, the disturbed/unsuitable material should be removed and replaced with a subbedding layer of compacted granular material, such as that meeting OPSS Granular B Type I or II. To provide adequate support for the sewer pipes in the long term in areas where subexcavation of material is required below design subgrade level, the excavations should be sized to allow a 1 horizontal to 1 vertical or 2 horizontal to 1 vertical spread of granular material down and out from the bottom of the pipes.

The granular bedding and subbedding materials should be compacted in maximum 200 millimetre thick lifts to at least 95 percent of the standard Proctor dry density value.

The use of clear crushed stone as a bedding, subbedding or cover material should not be permitted on this project.

5.4.3 Trench Backfill

In areas where the service trench will be located below or in close proximity to existing or future areas of hard surfacing (pavement, sidewalk, etc.), acceptable native materials should be used as backfill between the roadway subgrade level and the depth of seasonal frost penetration in order to reduce the potential for differential frost heaving between the area over the trench and

the adjacent hard surfaced area. The depth of frost penetration in exposed areas can normally be taken as 1.8 metres below finished grade. Where native backfill is used, it should match the native materials exposed on the trench walls. Backfill below the zone of seasonal frost penetration could consist of either acceptable native material, imported granular material conforming to OPSS Granular B Type I or II, or well shattered and graded excavated bedrock.

It is anticipated that most of the inorganic overburden materials encountered during the subsurface investigation will be acceptable for reuse as trench backfill. The existing asphaltic concrete should be wasted from the trench. If on site excavated bedrock is used as backfill within the service trench, it should be mostly 300 millimetres, or smaller, in size and should be well graded. To prevent ingress of fine material into voids in the blast rock, the upper surface of the blast rock should be blinded with well graded crushed stone, such as OPSS Granular B Type II.

To minimize future settlement of the backfill and achieve an acceptable subgrade for the pavement, the trench backfill should be compacted in maximum 300 millimetre thick lifts to at least 95 percent of the standard Proctor dry density value. Rock fill should be placed in maximum 500 millimetre thick lifts and compacted with the haulage and spreading equipment. The specified density for compaction of the backfill materials may be reduced where the trench backfill is not located below or in close proximity to existing or future areas of hard surfacing and/or structures.

6.0 ADDITIONAL CONSIDERATIONS

6.1 Winter Construction

Provision must be made to prevent freezing of any soil below the level of any footings, slabs or services. Freezing of the soil could result in heaving related damage.

Any service trenches should be opened for as short a time as practicable and the excavations should be carried out only in lengths which allow all of the construction operations, including backfilling, to be fully completed in one working day. The materials on the sides of the trenches should not be allowed to freeze. In addition, the backfill should be excavated, stored and replaced without being disturbed by frost or contaminated by snow or ice.

6.2 Effects of Construction Induced Vibration

Some of the construction operations (such as granular material compaction, excavation, hoe ramming, foundation construction etc.) will cause ground vibration on and off of the site. The vibrations will attenuate with distance from the source, but may be felt at nearby structures. We recommend that preconstruction surveys be carried out on the adjacent structures and that vibration monitoring be carried out during the construction so that any construction related claims can be dealt with in a fair manner.

6.3 Disposal of Excess Soil

It is noted that the professional services retained for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible surface and/or subsurface contamination, including naturally occurring source of contamination, are outside the terms of reference for this report.

6.4 Design Review and Construction Observation

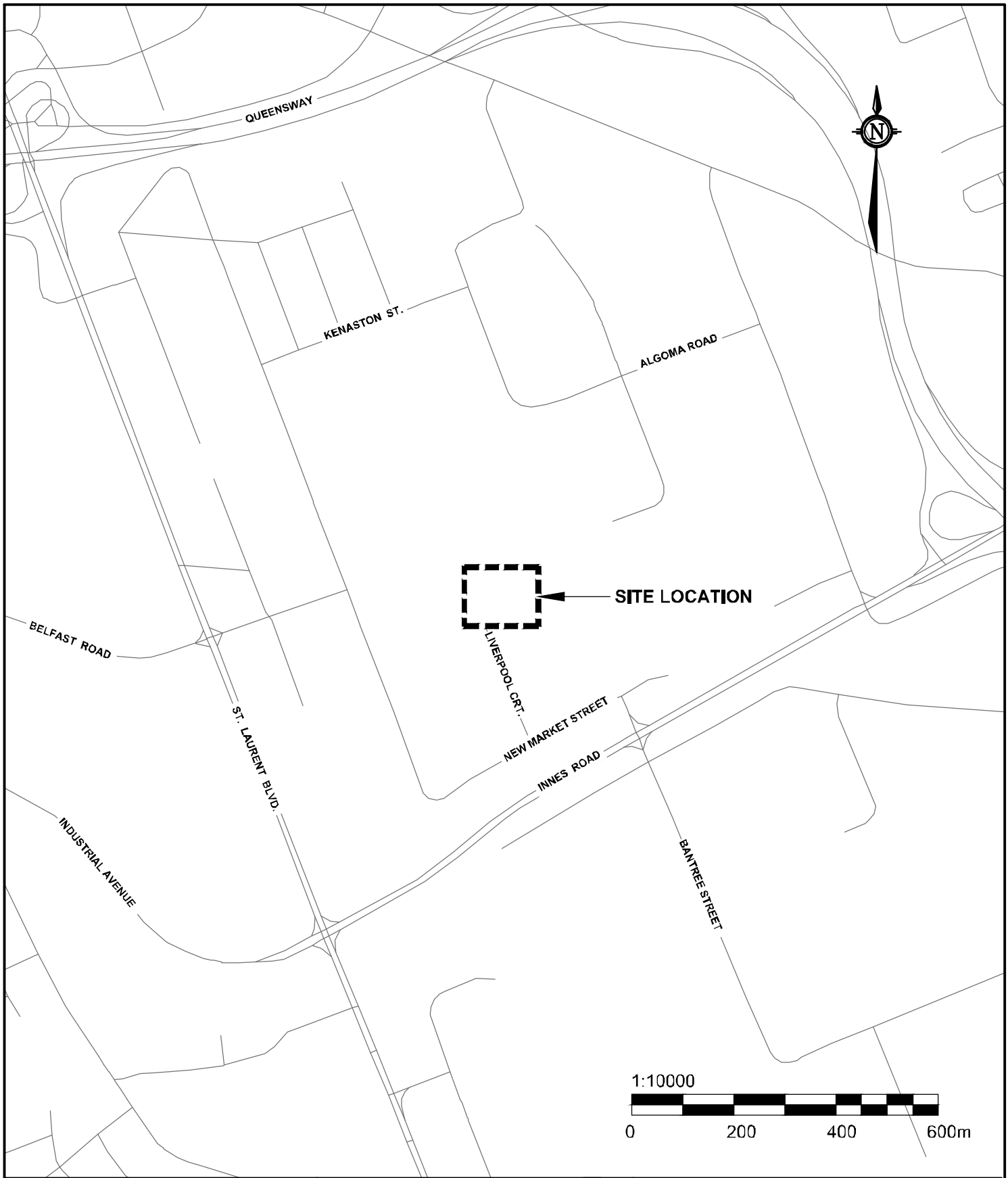
The details for the proposed construction were not available to us at the time of preparation of this report. It is recommended that the final design drawings be reviewed by the geotechnical engineer as the design progresses to ensure that the guidelines provided in this report have been interpreted as intended.

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed excavations do not materially differ from those given in the report and that the construction activities do not adversely affect the intent of the design. The subgrade surfaces for the building and site should be inspected by experienced geotechnical personnel to ensure that suitable materials have been reached and properly prepared. The placing and compaction of earth fill and imported granular materials should be inspected to ensure that the materials used conform to the grading and compaction specifications. In accordance with Ontario Building Code requirements, full time compaction testing is required for engineered fill below buildings.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

Joseph Berkers, B.Eng.

Johnathan A. Cholewa, Ph.D., P.Eng.



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Project	Drawing
GEOTECHNICAL INVESTIGATION 1571 LIVERPOOL COURT OTTAWA, ONTARIO	KEY PLAN

Drwn By	Chkd By	Date	Project No.	Revision No.	
P.C.	G.D.	AUGUST 2018	62788.04	0	**FIGURE 1**

P:\0. Files\62700\62788.04\Drafting\1. Drawings\62788.04_FG1_V01_2018-08-15.dwg, FIGURE 1, 18/08/15 10:05:35 AM

LEGEND

⌖ BOREHOLE LOCATION IN PLAN (current investigation by GEMTEC)

BH 18-1 ← BOREHOLE ID
67.43 ← GROUND SURFACE ELEVATION, IN METRE GEODETIC DATUM

Scale 1:750
0 15 30 45m

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Client	PYE & RICHARDS ARCHITECTS INC.	Project 62788.04
Location	1571 LIVERPOOL COURT, OTTAWA, ON	
Drwn by P.C.	Chkd by G.D.	BOREHOLE LOCATION PLAN
Date AUGUST 2018	Rev. 0	**FIGURE 2**

APPENDIX A

List of Abbreviations and Terminology
Record of Borehole Sheets

ABBREVIATIONS AND TERMINOLOGY USED ON RECORDS OF BOREHOLES AND TEST PITS

SAMPLE TYPES	
AS	Auger sample
CA	Casing sample
CS	Chunk sample
BS	Borros piston sample
GS	Grab sample
MS	Manual sample
RC	Rock core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled open shelby tube
TP	Thin-walled piston shelby tube
WS	Wash sample

SOIL TESTS	
w	Water content
PL, w_p	Plastic limit
LL, w_L	Liquid limit
C	Consolidation (oedometer) test
D_R	Relative density
DS	Direct shear test
G_S	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
UC	Unconfined compression test
γ	Unit weight

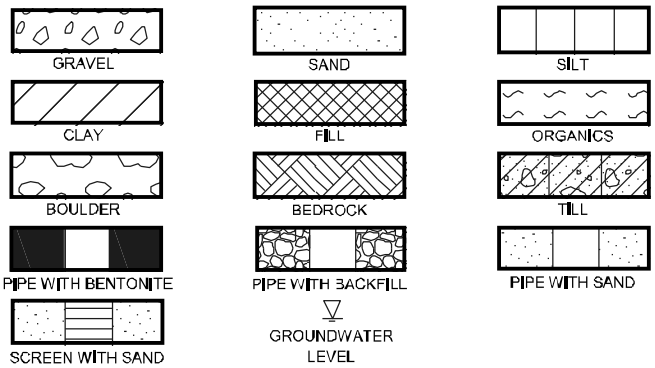
PENETRATION RESISTANCE

Standard Penetration Resistance, N
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 millimetres (30 in.) required to drive a 50 mm split spoon sampler for a distance of 300 mm (12 in.). For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

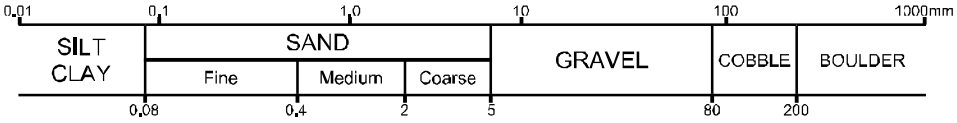
Dynamic Penetration Resistance
The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive a 50 mm (2 in.) diameter 60° cone attached to 'A' size drill rods for a distance of 300 mm (12 in.).

WH	Sampler advanced by static weight of hammer and drill rods
WR	Sampler advanced by static weight of drill rods
PH	Sampler advanced by hydraulic pressure from drill rig
PM	Sampler advanced by manual pressure

COHESIONLESS SOIL Compactness		COHESIVE SOIL Consistency	
SPT N-Values	Description	Cu, kPa	Description
0-4	Very Loose	0-12	Very Soft
4-10	Loose	12-25	Soft
10-30	Compact	25-50	Firm
30-50	Dense	50-100	Stiff
>50	Very Dense	100-200	Very Stiff
		>200	Hard



GRAIN SIZE



DESCRIPTIVE TERMINOLOGY

(Based on the CANFEM 4th Edition)

RECORD OF BOREHOLE 18-1

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, mm	SAMPLES BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		67.43						Cold patch asphaltic concrete
		Asphaltic Concrete		67.33						
		Brown crushed silty sand and gravel (BASE MATERIAL)		0.10 / 67.23	1	AS			VI	
		Dark brown crushed gravelly sand, trace silt (SUBBASE MATERIAL)		0.20 / 67.03	2	AS				Backfillwec with auger cuttings
1		Greyish brown silty clayey sand, trace gravel (FILL MATERIAL)		0.40	3	AS			MH	
				65.91						Borehole dry at completion of drilling
		End of borehole		1.52						
2										
3										
4										
5										

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

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CHECKED: J.B.

GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

RECORD OF BOREHOLE 18-2

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger; Hollow Stem Auger (210mm OD)	Ground Surface		67.23				
		Asphaltic Concrete		67.15				
		Brown sand and gravel (BASE MATERIAL)		0.08 / 66.95				
		Stiff to very stiff, brownish grey silty clay, trace gravel and sand (FILL MATERIAL)		0.28 / 66.62	1	SS	457	15
1		Loose, grey to brown SILT, some sand and clay		0.61 / 65.71	2	SS	356	8
2		Very dense, dark brown to dark grey silty sand, trace to some gravel, clay with cobbles and boulders (GLACIAL TILL)		1.52 / 62.66	3	SS	254	75
					4	SS	508	78
3					5	SS	305	67
4					6	SS	203	>50 for 100 mm
		End of borehole Auger refusal		4.57				
5								

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Cold patch asphaltic concrete
Backfilled with auger cuttings
Borehole dry at completion of drilling

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GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

RECORD OF BOREHOLE 18-3

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	PENETRATION RESISTANCE (N), BLOWS/0.3m ● / DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m ▲	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED / WATER CONTENT, % W_P W W_L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		Ground Surface		66.98								
0		Brown to dark brown sand and gravel (FILL MATERIAL)										
				66.68	1	SS	457	53				
		Brown silty sand, trace gravel (FILL MATERIAL)		0.30								
				66.32								
		Loose, brown to grey SILTY CLAYEY SAND		0.66								
1					2	SS	356	7			MH	
				65.61								
		Very dense, dark brown to dark grey, silty sand, some to trace gravel and clay with cobbles and boulders (GLACIAL TILL)		1.37								
2	Power Auger / Hollow Stem Auger (210mm OD)				3	SS	457	82				Backfilled with auger cuttings
					4	SS	556	70				
3					5	SS	406	>50 for 250 mm				
					6	SS	76	>50 for 130 mm				Groundwater observed in open borehole at about 2.9 metres below surface grade on August 8, 2018.
4												
		End of borehole Auger refusal		62.46 4.52								
5												

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
18/08/08	2.90 ▽	64.08

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CHECKED: J.B.

GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

RECORD OF BOREHOLE 18-4

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0		Ground Surface		67.55				
		Asphaltic Concrete		67.45				
		Brown sand and garvel, trace silt (BASE/SUBBASE MATERIAL)		0.10 67.25				
		Compact, dark brown to grey silty sand, trace to some clay with wood (FILL MATERIAL)		0.30	1	SS	356	22
1					2	SS	305	19
					3	SS	483	31
2	Power Auger Hollow Stem Auger (210mm OD)			65.72				
		Dense to very dense, grey to brown silty sand, trace gavel (GLACIAL TILL)		1.83	4	SS	508	48
3					5	SS	305	54
					6	SS	13	>50 for 76 mm
4								
		End of borehole Auger refusal		62.98 4.57				
5								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Cold patch asphaltic concrete
Backfilled with auger cuttings
Borehole dry at completion of drilling

GEMTEC
Consulting Engineers and Scientists

LOGGED: G.D.
CHECKED: J.B.

GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

RECORD OF BOREHOLE 18-5

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
0	Power Auger / Hollow Stem Auger (210mm OD)	Ground Surface		67.72				
		Asphaltic Concrete		0.04	1	SS	152	15
		Brown crushed sand and gravel, trace silt (BASE/SUBBASE MATERIAL)		67.04 / 0.68				
1		Very loose to compact, brown to black silty sand, some gravel (FILL MATERIAL)			2	SS	305	12
					3	SS	13	3
2				65.59 / 2.13				
		Very dense, brown to dark brown silty sand, trace to some gravel (GLACIAL TILL)			4	SS	406	84
3					5	SS	13	>50 for 76 mm
		End of borehole Auger refusal		63.96 / 3.76				
4								
5								

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Cold patch asphaltic concrete

Backfilled with auger cuttings

Groundwater observed in open borehole at about 3.5 metres below surface grade on August 8, 2018.

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEV. (m)
18/08/08	3.40 ▽	64.32

GEMTEC
Consulting Engineers and Scientists

LOGGED: G.D.
CHECKED: J.B.

GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

RECORD OF BOREHOLE 18-6

CLIENT: Pye & Ricahrcs Architects Inc.
PROJECT: 1571 Liverpool Court
JOB#: 62788.04
LOCATION: See Borehole Location Plan. Figure 2

SHEET: 1 OF 1
DATUM: CGVD2013
BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m
		Ground Surface		67.60				
		Asphaltic Concrete		67.52				
		Brown crushed sand and gravel (BASE/SUBBASE MATERIAL)		0.08 / 67.32				
		Compact to dense, brown to black sand, some gravel and silt (FILL MATERIAL)		0.28	1	SS	508	40
				66.84				
		Compact to dense, brown to grey silty sand, some gravel (GLACIAL TILL)		0.76	2	SS	508	14
					3	SS	127	19
					4	SS	406	39
				64.55				
		Weathered bedrock		3.05 / 64.42	5	SS	51	>50 for 120 mm
		End of borehole Auger refusal		3.18				

Power Auger
Hollow Stem Auger (260mm OD)

SAMPLES

PENETRATION RESISTANCE (N), BLOWS/0.3m
DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m
SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED
WATER CONTENT, % W_P W W_L
10 20 30 40 50 60 70 80 90

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

Cold patch asphaltic concrete
Backfilled with auger cuttings
Borehole dry at completion of drilling

GEMTEC
Consulting Engineers and Scientists

LOGGED: G.D.
CHECKED: J.B.

GEO - BOREHOLE LOG 62788.04_BOREHOLELOGS_2018-08-19.GPJ GEMTEC 2018.GDT 4/12/18

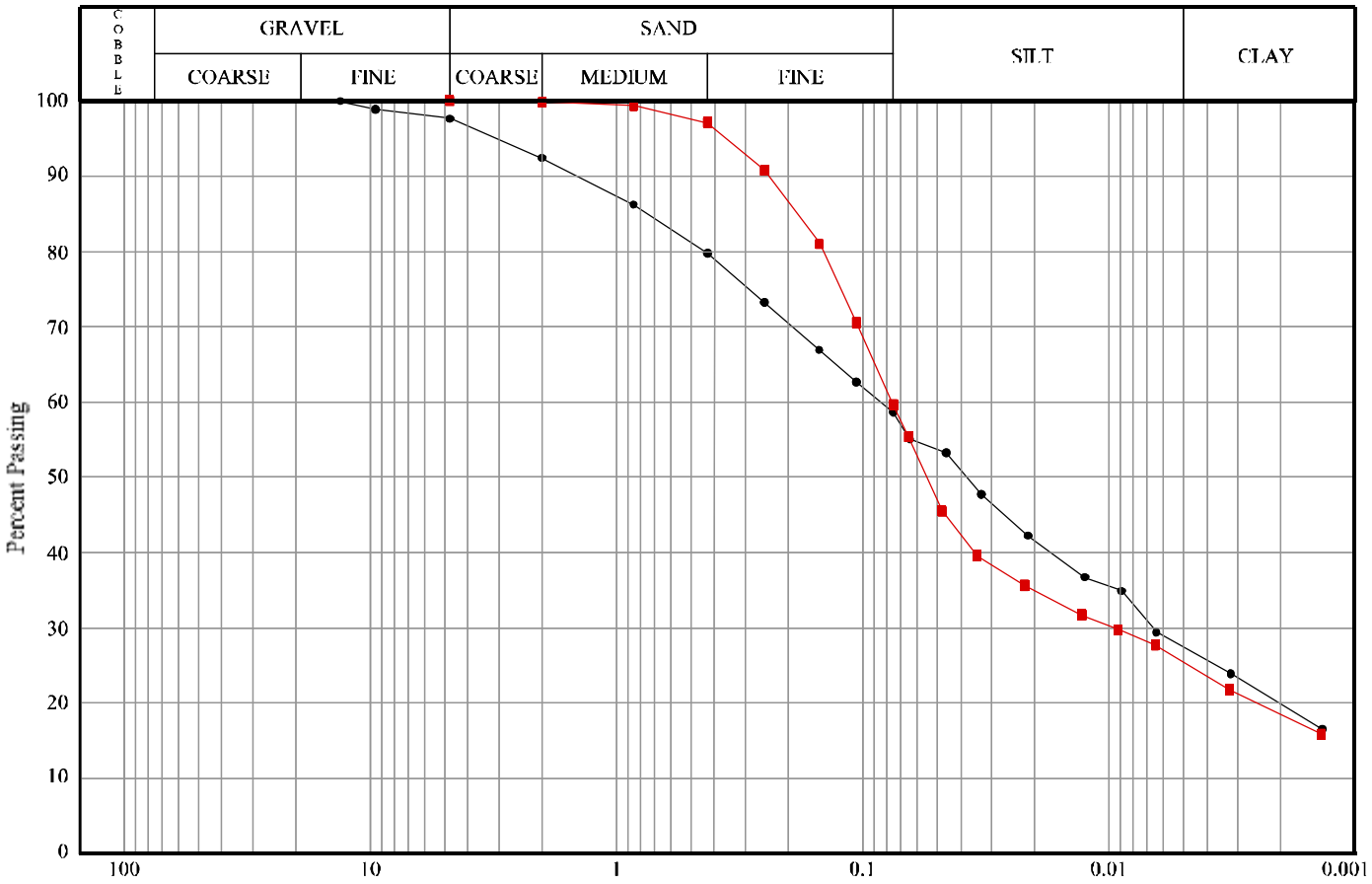
APPENDIX B

Grain Size Distribution Test Results

GEMTEC
Consulting Engineers and Scientists

Client:	Pye & Richards Architects Inc.
Project:	Surgenor Truck Centre
Project #:	6278804

Soils Grading Chart



Limits Shown: None

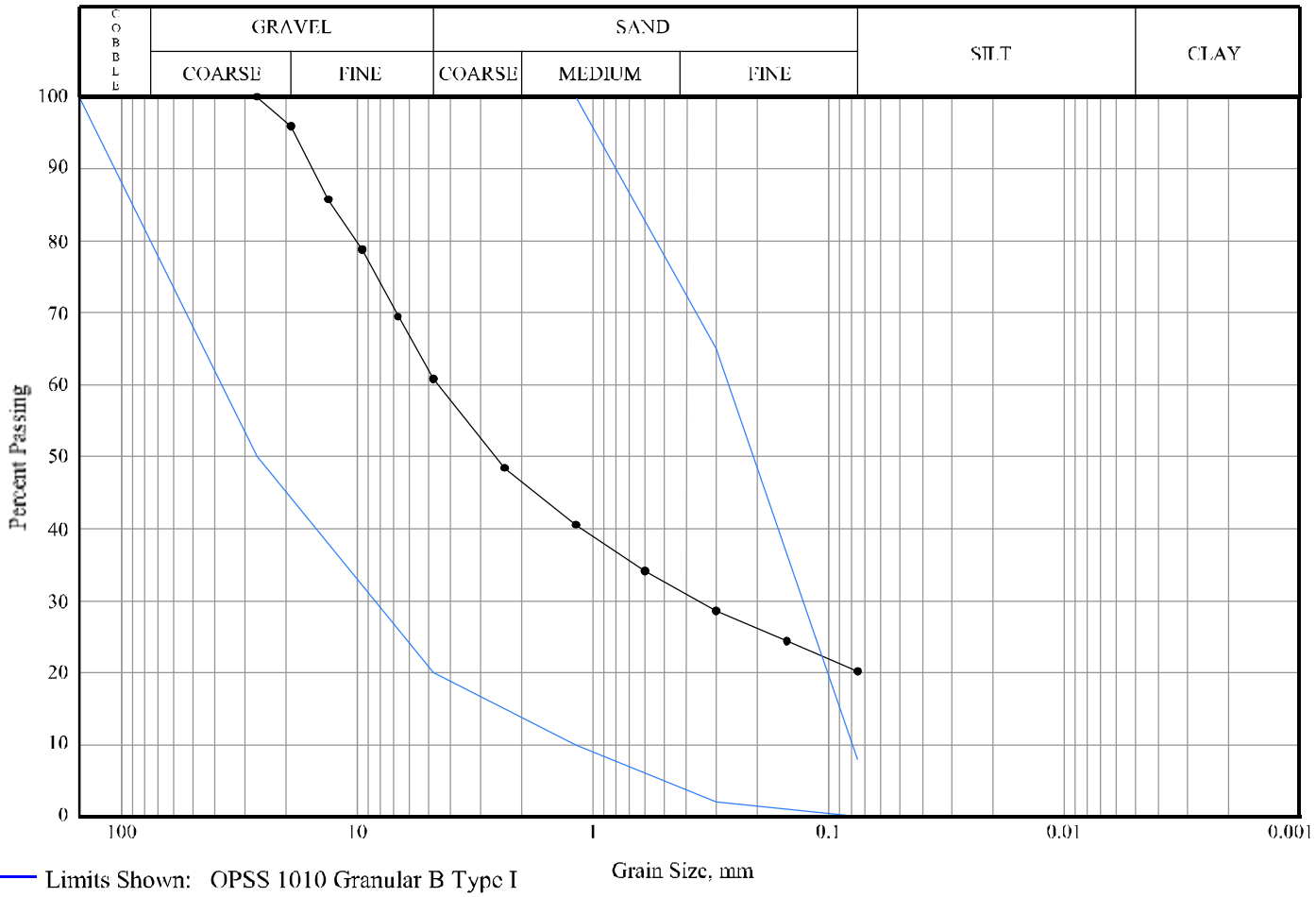
Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
	Fill Material	18-1	3	0.4-1.5	2.3	39.0	31.3	27.4
	Silty Clayey SAND	18-3	2	0.76-1.37	0.0	40.3	34.2	25.5

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
	Silty clayey sand , trace gravel	N/A	---	---	0.01	0.04	0.08	0.75	31.3
	Silty clayey sand	N/A	---	---	0.01	0.05	0.08	0.18	34.2

GEMTEC
Consulting Engineers and Scientists

Client:	Pye & Richards Architects Inc.
Project:	Surgenor Truck Centre
Project #:	6278804

Soils Grading Chart



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—	Roadway Base Material	18-1	1	0.1-0.2	39.2	40.6	20.2	

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
—●—	Silty sand and gravel		---	---	0.36	2.58	4.54	12.78	---

APPENDIX C

Soil Chemistry Relating to Corrosion
Paracel Laboratories Ltd. Order No. 1835069

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

GEMTEC Consulting Engineers and Scientists Limited

32 Steacie Drive
Kanata, ON K2K 2A9
Attn: Greg Davidson

Client PO:
Project: 62788.04
Custody: 109973

Report Date: 30-Aug-2018
Order Date: 24-Aug-2018

Order #: 1835069

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1835069-01	BH 18-4 SA3
1835069-02	BH 18-6 SA3

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: GEMTEC Consulting Engineers and Scientists Limited
Client PO:

Report Date: 30-Aug-2018
Order Date: 24-Aug-2018
Project Description: 62788.04

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	28-Aug-18	28-Aug-18
Conductivity	MOE E3138 - probe @25 °C, water ext	29-Aug-18	29-Aug-18
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	27-Aug-18	28-Aug-18
Resistivity	EPA 120.1 - probe, water extraction	29-Aug-18	29-Aug-18
Solids, %	Gravimetric, calculation	29-Aug-18	29-Aug-18

Certificate of Analysis

Client: GEMTEC Consulting Engineers and Scientists Limited

Client PO:

Report Date: 30-Aug-2018

Order Date: 24-Aug-2018

Project Description: 62788.04

	Client ID:	BH 18-4 SA3	BH 18-6 SA3	-	-
	Sample Date:	08/24/2018 09:00	08/24/2018 09:00	-	-
	Sample ID:	1835069-01	1835069-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	90.2	86.1	-	-
General Inorganics					
Conductivity	5 uS/cm	136	641	-	-
pH	0.05 pH Units	7.69	7.72	-	-
Resistivity	0.10 Ohm.m	73.3	15.6	-	-
Anions					
Sulphate	5 ug/g dry	18	620	-	-

experience • knowledge • integrity

civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité

Surgenor Truck Centre
Addition & Renovations
1571 Liverpool Court
Ottawa, Ontario.
K1B 4L1.

Date _____

Danpat Limited, operating as
Surgenor Truck Centre
1571 Liverpool Court
Ottawa, Ontario.

Dear Sir:

1. I/We _____
(Legal Company Name)
of _____
(Business Address)

hereby offer to Danpat Limited to furnish all material, labour, plant, tools, deliver and erect all material, including freight charges, duty, exchange, equipment and supervision and all other charges to complete the work as set out in the tender documents and all prime costs, allowances and applicable Government sales and other taxes in force at this date, (but not including H.S.T.), for the stipulated sum of:

_____

_____ Dollars ($ _____)

2.(a) IN SUBMITTING THIS TENDER, we recognize the right of the Owner to accept or reject any tender at the price submitted, it being understood that revised tenders shall not be called for if minor changes only are contemplated.

(b) I/We, THE UNDERSIGNED, agree to accept the decision of the Owner if it is found to be in the best interest of the Owner, to cancel any section of this tender.

(c) I/We, also agree to make minor changes to the work prior to award of the contract should it be in the Owner's best interest to do so, to promptly provide acceptable cost breakdowns related to such changes, and to make fair and reasonable adjustments to the contract price.

3. I/We enclose herewith as a Tender Security a surety bond, certified cheque, or bank draft written in favour of Danpat Limited in the amount of which is not less than ten percent (10%) of our tender to be held in escrow and dealt with (as described in Article 10 of Instructions to Tenderers.)

4. I/We the UNDERSIGNED agree to complete the Work ready for Final Cccupancy by 15 November 2019.

5. I/We the UNDERSIGNED agree to Substantially Perform the total Work in _____ consecutive weeks from after the official commence work order.

6. I/We, FURTHER DECLARE that this tender is made without knowledge, comparison of figures or arrangement with any other company, firm, or person submitting a tender for the same work..

7. I/We, THE UNDERSIGNED, offer to perform the work in strict accordance with the full intent of the following documents:

    1. The Specifications titled “Surgenor Truck Centre Addition & Renovations.”
    2. The Drawings, listed in the above mentioned specifications.
    3. The following addenda issued by Pye & Richards Architects Inc.

    ADDENDUM NO. _____ DATE _____

    ADDENDUM NO. _____ DATE _____

    ADDENDUM NO. _____ DATE _____

8. I/We, agree that the unit prices described in the attached "Section 00 43 22 - Unit Prices" may be used for adjustments to the Contract Price for work which may be called later.

9. I/We further declare that the following are the names of Sub-contractors whose tenders we have used to make this tender and whom we would employ to execute the representative trades:

    Drywall _____
    Composite Aluminum Panels _____
    Structural Steel _____
    Mechanical (HVAC) _____
    Electrical _____

10. I/We, agree to provide Section 00 43 36 Proposed Subcontractors Form within 24 hours of request, completed as required.

11. I/We, have visited and carefully examined the site of the work and have satisfied and informed myself/ourselves as to all the existing conditions, limitations, and difficulties which may arise and govern the completion of the work.

12. I/We, the UNDERSIGNED, agree that within ten (10) days after the issuance of a commence work order, I/We will commence the work, assembling all necessary labour forces and equipment on the site and will continue the work with the utmost

diligence until completion.

13. I/We, THE UNDERSIGNED, agree to hold to the tender figures submitted for a period of thirty (30) days from date of Tender closing.

14. I/We, THE UNDERSIGNED, agree, if this tender is accepted, to furnish approved surety bonds for the proper fulfilment of the contract as required under the terms of the General Conditions, and to execute agreement in triplicate both within ten (10) days of being notified so to do by the Owner. In the event of default or failure on MY/OUR part so to do, I/WE agree that the Owner shall be at liberty to retain the money deposited by ME/US to the use of the Owner and to accept the next lowest or any tender, or to advertise for new tenders; or to carry on the work in any other way they may deem best; and I/WE also agree to pay to the Owner the difference between this tender and any greater sum which the Owner may expend or incur by reason of such default or failure, or by reason of such action, as aforesaid, on their part, including the cost of advertisement for new tenders, and to indemnify and save harmless the said Owner and their officers from all loss, damage, cost charges and expenses which they may suffer to be put to by reason by any such default, or failure on MY/OUR part.

15. CONTRACTOR'S SIGNATURE
OR IF TENDER IS SUBMITTED
BY AN INCORPORATED COMPANY
ITS SEAL ATTESTED BY THE
HANDS OF ITS PROPER OFFICERS _____ Seal

NAME & TITLE _____

Herewith are the Unit Prices referred to in Item 8 of the Tender

submitted by: _____.

To: DanPat Limited, operating as Surgenor Truck Centre.
For: Surgenor Truck Centre Addition & Renovations.
1571 Liverpool Court., Ottawa, Ontario. K1B 4L1.

Dated _____ and which is an integral part of the above noted Tender.

(a) All material, excavation, supply and replacement of concrete, equipment, forms, removal of surplus materials and the fulfilment of all requirements of the Drawings and Specifications are included within the total stipulated sum tendered.

(b) The "Unit Prices" listed herein may be used by the Owner to determine payments for alterations, extras and deductions to the original contract quantities only.

(c) The "Unit Prices" are inclusive of the Contractor's and Subcontractor's overheads and profits, and all other related charges including labour, material, fabrication and installation.

(d) Credits will be calculated at the Unit Prices less 10%.

Item No.	Description	Unit Price
1	Bulk excavation and disposal of sub-grade materials, (excluding rock) by machine:	$_____/$m^3$
2	Trench excavation and disposal of sub-grade materials, (excluding rock) machine:	$_____/$m^3$
3	Backfill, compacted, Granular “B” Type II	
	a) in trenches	$_____/$m^3$
	b) elsewhere	$_____/$m^3$
4	Backfill, compacted, Engineered Fill	
	a) in trenches	$_____/$m^3$
	b) elsewhere	$_____/$m^3$

Dated_____ Signed and Sealed_____

Name and Title _____

Herewith is the list of Proposed Subcontractors referred to in Item 9 of the Tender

submitted by: _____

To: DanPat Limited, operating as Surgenor Truck Centre.
For: Surgenor Truck Centre Addition & Renovations.
1571 Liverpool Court., Ottawa, Ontario. K1B 4L1.

dated _____ and which is an integral part of the above noted Tender. I/We agree that this list may only be changed in accordance with General Condition 3.7 and relevant Supplementary Conditions of the Contract. We have ascertained that these Subcontractors are capable of executing the work to the kind and quality specified and within the time and other limitations required.

(NOTE: Use of the term "Own Forces" must be documented as per Section 00 43 36)

Concrete Formwork _____

Reinforcing Steel, Fabrication and Setting _____

Concrete Finishing _____

Structural Steel _____

Miscellaneous Metal _____

Roofing _____

Cabinetry _____

Insulated Metal Panels _____

Caulking _____

Steel Doors and Frames _____

Wood Doors _____

Windows _____

Door Hardware _____

Ceramic _____

Painting _____

Plumbing _____

Sprinkler _____

HVAC _____

Earthwork _____

Asphalt Paving and Curbs _____

Site Services _____

Fencing & Gates (including Operators) _____

Tenderer's Signature)
or if Tender is submitted by)
an incorporated company its)
seal attested by the hands)
of its proper officers.)

_____

Seal

1.
Form of Agreement

.1 The form of agreement which the successful tenderer will be required to execute is the Standard Construction Document, CCDC 2, 2008 Stipulated Price Contract.

.2 This Form of Agreement was prepared by the Canadian Construction Documents Committee and copies of this document are available at the Consultant's office for examination by Tenderers.

.3 It is the responsibility of each trade tendering portions of the work to familiarize himself with the Form of Agreement.

.4 The Form of Agreement is hereby made a part of these documents to the same extent as if bound herein.

2.
General Conditions

.1 The General Conditions of the Standard Construction Document CCDC 2, 2008 Stipulated Price Contract; Articles GC1 to GC12 inclusive shall govern the Work of this Contract.

.2 The Definitions forming part of CCDC2, 2008 shall apply to all Contract Documents.

.3 These General Conditions and Definitions are hereby made a part of these documents to the same extent as if bound herein.

3.
Amendments to
the Agreement

.1 Article A-1:
a) Delete para. 1.3 and substitute:
"1.3 commence the Work by the 15st day of June in the year 2017, and subject to adjustment in Contract Time as provided in the Contract Documents, complete the Work ready for occupancy by the 1st November 2017.

.2 Article A-5:
a) In para. 5.1, insert in spaces provided "ten" and "10".
b) In para. 5.3.1; insert in space provided "Bank of Canada".

c) Add para. “5.4. The Owner may withhold, or nullify in whole or in part, any certificate for payment to such an extent as may be necessary to protect the Owner from loss on account of:

.1 Defective or deficient work not remedied.
.2 Claims filed or delivered, or reasonable evidence indicating probable filing of a claim.
.3 Failure of the Contractor to make payments properly to Subcontractors, Suppliers, or workers or for material or labour.
.4 A reasonable doubt that the Contract can be completed for the balance then unpaid.
.5 Damage to another Contractor.
.6 Legal costs related to lien action.

When the above issues are resolved or remedied, amounts withheld will be paid. No interest will be paid on amounts withheld.”

.3 Article A-7:
a) In para. 7.1, strike out “French”.

4.
Supplementary Definitions

.1 Add the following definitions:

“0a. “Architect” means “Consultant”.

“0b. Authorized, Directed, Required, Requested, Approved, Ordered, Sanctioned, and Satisfactory: Unless some other meaning is obvious form the context, the above words mean respectively, authorized directed, required, approved ordered sanctioned by and satisfactory to the Consultant”.

“19a. Submittals
Submittals are documents or items required by the Contract Documents to be provided by the Contractor, such as:
- Shop Drawings, samples, models, mock-ups to indicate details or characteristics, before the portion of the Work that they represent can be incorporated into the Work; and
- Record drawings and manuals to provide instructions to the operation and maintenance of the Work.”

END OF SECTION

1.
General

.1 In accordance with GC 1.1, para. 1.1.7.1 of the General Conditions of the Contract, CCDC 2-2008, these Supplementary Conditions supersede those General Conditions of the Contract herein referenced, and form part of the Contract Documents for the Work.

.2 Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

GC 1.1
Contract Documents

.1 Add to the end of sub-para. 1.1.2.2: “Except where the Consultant shall be indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4, 9.2.8.4, 9.5.2.4 and 9.5.3.4 and in 12.1.1.”

.2 Add sub-para “1.1.7.5 in case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the Contract Documents.”

.3 Delete para. 1.1.8 and replace with the following:
"The Owner shall provide the Contractor, without charge, with twenty-five (25) copies of the Contract Documents to perform the Work.”

.4 Add para.: "1.1.11 The specifications are not intended as detailed description of the Work but serve to indicate particular requirements of the completed Work."

GC 2.2
Role of the Consultant

.1 Delete para. 2.2.4. in its entirety.

.2 Add the word “schedules” after the word “techniques” in para. 2.2.6.

.3 Add to the end of the second sentence of para. 2.2.6 “or to adhere to the construction schedule.”

.4 Add at the end of para. 2.2.9 “The Owner and the Contractor shall waive any claims against the Consultant arising out of the making of such interpretations and findings in accordance with para. 2.2.7 , 2.2.8, and 2.2.9.”

.5 Add new sentence to end of para. 2.2.11 “The Consultant’s obligation to make findings on a large claim or large number of claims is subject to the terms and conditions of the Owner/Consultant agreement.”

.6 Delete the comma after the word “submittals” and add the words “which are provided” before the words “in accordance” in para 2.2.14.

.7 Add sub-para.: “2.2.13.1 Supplemental Instructions shall be issued in the form attached hereto titled “Supplemental Instructions”.

GC 2.3
Review and
Inspection of Work

.1 From para. 2.3.2 and 2.3.4 delete the phrase: "tests, inspections, or approval" and replace with; "tests, inspections, review, or approval".

GC 2.4
Defective Work

.1 Add sub-para. 2.4.1.1 and 2.4.1.2:
“2.4.1.1 The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Consultant.”
“2.4.1.2 The Contractor shall prioritize the correction of any defective work which, in the sole discretion of the Owner, adversely affects the day to day operation of the Owner.”

GC 3.1
Control of the Work

.1 Add the word “schedules” after the word “techniques” in para. 3.1.2.

.2 Add para.: “3.1.3 Prior to commencing individual procurement, fabrication and construction activities, the Contractor shall verify, at the Place of the Work, all relevant measurements and levels necessary for proper and complete fabrications, assembly and installation of the Work and shall further carefully compare such field measurements and conditions with the requirements of the Contract Documents. Where dimensions are not included or exact locations are not apparent, the Contractor shall immediately notify the Consultant in writing and obtain written instructions from the Consultant before proceeding

with any part of the affected work."

.3 Add para.: "3.1.4 Work shall not be commenced nor shall any material be procured, until the Contractor has signed the Contract or received a written order, or orders to commence the Work, signed by the Consultant or Owner; and it shall thereupon be at once begun and continuously carried on to completion, (subject as herein provided), and shall be completed and full possession thereof given the Owner within the period provided, counting from the date of order to commence, unless an extension of time, in writing, shall be allowed by the Consultant, in which case the Work shall be carried on to completion, and possession given to the Owner within the additional period so allowed."

.4 Add para.: "3.1.5 TIME IS OF THE ESSENCE IN THIS CONTRACT and in the event of labour disputes or if ordered by the Consultant, the Contractor and his Subcontractors and their employees shall be required to work such additional or overtime hours as may be necessary to ensure Substantial Performance of the various stages of the Work under this contract in the specified times. The Contractor shall be entitled to payment for additional costs incurred as the result of such order only if the delay is a result of a cause beyond the Contractor's control."

GC 3.2
Construction by Owner
or Other Contractors

.1 Sub-Para. 3.2.2.2. Delete.

.2 Add sub-para.: "3.2.3.4 Maintain overall responsibility for compliance with the applicable health and construction safety legislation at the Place of the Work."

GC 3.4
Document Review

.1 Delete para. 3.4.1 in its entirety and substitute new para.: "3.4.1 The Contractor shall review the Contract Documents and shall report promptly to the Consultant any error, inconsistency or omission the Contractor may discover. Such review by the Contractor shall comply with the standard of care described in paragraph 3.14.1 of the Contract. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or the Consultant for the accuracy of the Contract Documents. The Contractor shall not be liable for damage or

costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not reasonably have discovered. If the Contractor does discover any error, inconsistency or omission in the Contract Documents, the Contractor shall not proceed with the work affected until the Contractor has received corrected or missing information from the Consultant."

GC 3.6
Supervision

.1 3.6.1 Add at end of last sentence "and only with the Owner's prior agreement."

.2 Add para.: "3.6.3 The Owner may, for reasonable cause, and at anytime, object to the use of a proposed representative, superintendent or project manager and require the Contractor to employ more competent personnel.

GC 3.7
Subcontractors and Suppliers

.1 Delete the words "through the Consultant" in para. 3.7.6.

GC 3.8
Labour and Products

.1 Add para.: "3.8.4 The Contractor is responsible for the safe on-site storage of Products and their protection (including Products supplied by the Owner and other contractors to be installed under the Contract) in such ways as to avoid dangerous conditions or contamination to the Products or other persons or property and in locations at the Place of the Work to the satisfaction of the Owner and the Consultant. The Owner shall provide all relevant information of the Products to be supplied by the Owner."

GC 3.10
Shop Drawings

.1 Add the words "And Other Submittals" to the Title after Shop Drawings.

.2 Add "and Submittals" after the words "Shop Drawings" in para. 3.10.1, 3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, 3.10.11, and 3.10.12.

.3 Add at end of para. 3.10.1: "or as the Consultant may reasonably request."

.4 Delete 3.10.3 in its entirety and substitute new para: "3.10.3

The Contractor shall prepare a schedule of the dates for provision, review and return of Shop Drawings and Submittals and submit it to the Consultant for review."

.5 Delete the last sentence in para. 3.10.9.

.6 Delete the words "so as to cause no delay in the performance of the Work" in para. 3.10.12.

GC 3.11
Use of Work .1 Add para.: "3.11.3 The Owner has the right to enter and occupy the Work in whole or in part before completion of the Work, if, in the opinion of the Consultant, such entry or occupation does not prevent or unduly interfere with the Contractor in the completion of the Work. Such entry or occupancy does not signify acceptance of the Work nor in any way relieve the Contractor's responsibility to complete the Work".

Add
"GC 3.15
Occupancy of the Work .1 3.15.1 Whether the Project contemplates Work by way of renovations in buildings which will be in use or be occupied during the course of the Work or where the Project involves Work that is adjacent to a structure which is in use or is occupied, the Contractor, without in anyway limiting it's responsibilities under the Contract, shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, to suppress dust and noise and to avoid conditions likely to propagate mould or fungus of any kind and all other steps reasonably necessary to promote and maintain the safety and comfort of the users and occupants of such structures or adjacent structures."

GC 4.1
Cash Allowances .1 Delete para 4.1.4 in its entirety and substitute new para.: "4.1.4 Where the actual cost of the Work under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the Consultant's direction and with the Owner's approval, to cover the shortfall, and, in that case, there shall be no additional amount added to the Contract Price for overhead and profit. Only where the actual cost of the Work under all cash allowances exceeds the total amount of all cash allowances shall the Contractor be compensated for the

excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the Contract Documents."

.2 Delete para. 4.1.5 in its entirety and substitute new para.: "4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in para. 4.1.4, shall be deducted from the Contract Price by Change Order without any adjustment for the Contractor's overhead and profit on such amount."

.3 Delete para. 4.1.7 in its entirety and substitute new para.: "4.1.7. The Contractor shall prepare a schedule that shows when the Owner must authorize ordering of items called for under cash allowances to avoid delaying the progress of the work."

.4 Add new para.: "4.1.8 The Owner reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work, to be paid for from cash allowances."

GC 5.1
Financing Information
Required of the Owner

.1 Delete para. 5.1.1 and 5.1.2 in their entirety.

GC 5.2
Applications for
Progress Payment

.1 Add sub-para.: "5.2.7.1 Claims for products delivered to the site, but not yet incorporated into the Work shall be supported by invoices indicating the description, quantity and value of the products. If the products have not been incorporated in the Work before submission of the next progress claim, a copy of the invoice, receipted by the supplier, must be attached or the value of these products may be deducted. Material delivered to site and paid for shall remain the Contractor's full responsibility until built in."

.2 Add para.: "5.2.8 The Contractor shall submit with his second and all subsequent applications for progress payment, a Statutory Declaration on the applicable CCDC-9-2001 form".

.3 Add para.: "5.2.9 All applications for payment shall identify value added tax separately. Administrative costs associated with the Contractor's obligations to Revenue Canada shall be borne by the Contractor.

GC 5.3

Progress Payments

.1 Delete sub-para. 5.3.1.1 in its entirety.

.2 Add at end of sub-para. 5.3.1.2: " If the Consultant amends the application, the Contractor shall amend his application for payment to match the Consultant's amendments and reissue it to the Consultant within 5 calendar days after receipt of the Consultant's amendments."

GC 5.5
Payment of Holdback
Upon Substantial
Performance of the Work

.1 Delete para. 5.5.3 in its entirety.

GC 5.6
Progressive
Release of Holdback

.1 Amend para. 5.6.1 in third line by changing "Owner shall pay" to "Owner may pay".

GC 5.7
Final Payment

.1 Amend para. 5.7.4 by changing period of "5 calendar days" to "21 calendar days".

Add:

"GC 5.10
Materials On Site

.1 5.10.1 All materials used or provided by the Contractor for the Work shall from the time of being so acquired, used, provided or brought onto the site become the property of the Owner for the purposes of the Work and they shall continue to be the property of the Owner until incorporated in the Work or until the Owner indicates that it is satisfied that they will not be required for the Work.

.2 5.10.2 Material that is the property of the Owner by virtue of this Article shall not be taken away from the site of the Work or used or disposed of except for the purposes of the Work without the consent in writing of the Owner.

.3 5.10.3 The Owner is not liable for loss or damage to material that is the property of the Owner by virtue of this Article and the Contractor is liable for such loss or damage notwithstanding that the material is the property of the Owner."

GC 6.2
Change Orders

.1 Amend second sentence of para. 6.2.1 to begin “Within 10 Working Days the Contractor shall present,....”

.2 Add sub-para.: “6.2.1.1 Notices describing proposed changes in the Work shall be made on the form appended hereto titled "Contemplated Change Order".

.3 Add sub-para.: “6.2.2.1 Change Orders shall be issued in the form attached hereto titled "Change Order".

.4 Add sub-para.: “6.2.1.2 If a change in the Work, not covered by unit prices or by estimate and acceptance in a lump sum, results in a net increase in the Contract Price, the charge to the Owner shall be the cost of the work plus:
(a) a maximum charge of 15% covering overhead and profit for work done by the Contractor’s own forces.
(b) a maximum charge of 10% covering overhead and profit for work done by a Subcontractor. Subcontractors shall be permitted a maximum percentage of 15% covering overhead and profit for work done by the Subcontractor’s own forces.
(c) a maximum change of 5% covering overhead and profit for work done by a sub-Subcontractor. Subcontractors shall be permitted a maximum percentage of 10% covering overhead and profits for work done by a sub-Subcontractor. Sub-Subcontractors shall be permitted a maximum percentage of 15% covering overhead and profit for work done by a sub-Subcontractor’s own forces.”

.5 Add sub-para.: “6.2.1.3 If a change in the Work results in a net decrease in the Contract Price, the amount of the credit shall be the net cost, without deduction for overhead or profit. When both additions and deletions covering related work or substitutions are involved in a change in the Work, the allowance for overhead and profit shall be calculated on the basis of the net increase, if any, with respect to that change in the Work.

.6 Add sub-para.: “6.2.1.4 The rates enumerated in sub-para. 6.2.1.2 and 6.2.1.3, shall apply to charges resulting in addition to or deductions from the Contract not exceeding $ 20,000.00. The portion of charges which involve additions to or deletions from the Contract Price in excess of $ 20,000.00 shall carry an overhead and profit percentage of half those called for above.”

.7 Add sub-para.: “6.2.1.5 Labour costs shall be the actual rates paid to the workers plus a documented mark-up (not exceeding 100 % of actual wage rates) to cover contributions, assessments, or taxes incurred for such items as

unemployment and other insurance, provincial health insurance, Workplace Safety Insurance, Canada or Quebec Pension Plan, Holiday & Vacation Pay, Travelling Time, Travel and Parking, Welfare, Union, Industry Training and Pension Funds, rest periods, down time, personal hygiene, and other benefits paid to workers, personal protection, small tools and the like. Travel time to and from site shall be at no charge to the Owner."

.8 Add sub-para.: “6.2.1.6 The percentage for office overhead and profit shall also cover financing, project management, estimating and processing of change orders, shop drawing review, record drawings, and all site overheads such as superintendence, site facilities, safety, clean-up and items of small plant, equipment and tools and the like."

.9 Add to para.: “6.2.1.7 Complete breakdown of all costs submitted for consideration due to changes in the Work shall be furnished to the Consultant for both Contractor's work and Subcontractors' work."

.10 Add sub-para.: “6.2.1.8 Breakdown shall show areas and quantities on which costs are based, unit costs for labour and material, wage burdens and other direct costs, and all information necessary for a complete understanding of the costs submitted. In the case of changes involving Subcontractors actual photocopies of Subcontractors' quotations shall be provided in support of each claim for extra or credit offered. Subcontractor's quotations shall be broken down as specified above."

.11 Add sub-para. : “ 6.2.1.9 Should the Contractor proceed with any change in the method of construction, volume or location of the Work which has not been both ordered and valued as set out above, or as a Change Directive, it shall be conclusively presumed that the parties were in agreement that such change should be made at no additional cost to the Owner.”

.12 Add sub-para.: “6.2.1.10 A change order signed by the Contractor indicates his/her complete agreement therewith, including the adjustment if any, in the Contract Price and the Contract Time. Contractor agrees that in no event shall he/she make any subsequent claim relating to the items covered by such change order, either regarding the Contract Price, or the Contract Time. Except as permitted in GC 6.3.5, the Contractor shall not bill for changes in the Work until after a Change Order has been executed by the Contractor, Architect,

and Owner."

.13 Add sub-para.: “6.2.11 The Contractor shall not be entitled to any interest upon any bill for extra work on account of delay in its approval.”

GC 6.3
Change Directive

.1 Add sub-para.: “6.3.1.1 Change Directives shall be issued in the form attached hereto titled "Change Directive".

.2 Add sub-para.: “6.3.2.1 The allowance for overhead and profit shall be in accordance with General Condition 6.2 and relevant supplementary conditions”.

GC 6.4
Concealed or
Unknown Conditions

.1 Add sub-para.: “6.4.5 The Contractor confirms that, prior to bidding the Project, it carefully investigated the Place of the Work and applied to that investigation the degree of care and skill described in paragraph 3.14.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the Contractor prior to submission of bid, and the sufficiency and completeness of the information provided by the Owner. The Contractor is not entitled to compensation or to an extension of the Contract Time for conditions which could reasonably have been ascertained by the Contractor by such careful investigation undertaken prior to the submission of the bid.

GC 6.5
Delays

.1 Delete the period at the end of para. 6.5.1, and substitute the following words: “, but excluding any consequential, indirect or special damages.”

.2 Delete the period at the end of para. 6.5.2, and substitute the following words: “, but excluding any consequential, indirect or special damages.”

.3 Add sub-para.: “6.5.6 If the Contractor is delayed in the performance of the Work by an act of omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any cause within the Contractor’s control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultant as a result of such delay by the

Contractor and, in particular, the cost of the consultant's services during the period between the date of Substantial Performance of the Work stated in Article A-1 herein as the same may be extended through the provisions of these General Conditions and any later, actual date of Substantial Performance of the Work achieved by the Contractor."

.4 Add para.: "6.5.7 Should Work be closed down for any cause, the Contractor shall provide protection for footings, foundations and any other part of the Work likely to become damaged during the interim between work stoppage and work resumption. The Contractor shall be reimbursed by the Owner for reasonable costs incurred by the Contractor for this work if the Work is closed down by an action or omission of the Owner, Consultant, or anyone employed or engaged by them directly or indirectly contrary to the provisions of the Contract Documents or by a stop work order issued by a court or other public authority and providing that such order was not issued as a result of an act or fault of the Contractor or any person employed or engaged by the Contractor, directly or indirectly."

.5 Add para: "6.5.8 The Contractor shall provide the Consultant with prompt written notice of any actual or anticipated labour dispute which may reasonably be expected to affect the Contractor's performance of the Work."

CG 6.6
Claims for a Change
in Contract Price

.1 Delete para. 6.6.5. in its entirety and substitute new para.: "6.6.5. The Consultant's findings, with respect to a claim made by either party will be given by Notice in Writing by the Consultant to both parties within reasonable time after receipt of the claim information noted in paragraph 6.6.3."

.2 Add para.: "6.6.7. The Owner may make claims arising out of the costs incurred for additional services provided by the Consultant resulting from the Contractor's failure to reasonably perform the Work in accordance with the terms and conditions of the Contract, including the Contractor's issuance of unnecessary Requests for Information. The Consultant will notify the Owner and Contractor where it has been determined that additional services will be required or have been provided in order not to cause a delay. The Owner shall make claims based on the Consultant's invoices."

GC 7.2
Contractor's Right to
Stop the Work or

Terminate the Contract .1 Delete sub-para. 7.2.3.1 in its entirety.

GC 8.2
Negotiation, Mediation
and Arbitration .1 Add paras:

"8.2.9 Within five days of receipt of the notice of arbitration by the responding party under paragraph 8.2.6, the Owner and the Contractor shall give the Consultant a written notice containing:

a) a copy of the notice of arbitration

b) a copy of supplementary conditions 8.2.9 to 8.2.15 of this Contract, and;

c) any claims or issues which the Contractor or the Owner, as the case may be, wishes to raise in relation to the Consultant arising out of the issues in dispute in the arbitration

8.2.10 The Owner and the Contractor agree that the Consultant may elect, within ten days of receipt of the notice under paragraph 8.2.9, to become a full party to the arbitration under paragraph 8.2.6 if the Consultant:

a) has a vested or contingent financial interest in the outcome of the arbitration;

b) gives the notice of election to the Owner and the Contractor before the arbitrator is appointed;

c) agrees to be a party of the arbitration within the meaning of the rules referred to in paragraph 8.2.6, and,

d) agrees to be bound by the arbitral award made in the arbitration.

8.2.11 If the Consultant is not given the written notice required under paragraph 8.2.9, both the Owner and the Contractor are estopped from pursuing an action, counter claim or other proceeding or making an application against the Consultant arising out of the issues in dispute in the arbitration between the Owner and the Contractor under paragraph 8.2.6.

8.2.12 If an election is made under paragraph 8.2.10, the Consultant may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.2.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the respondent receives a copy of the notice of arbitration.

8.2.13 The arbitrator in the arbitration in which the Consultant has elected under paragraph 8.2.10 to become full party may:

a) on application of the Owner or the Contractor, determine whether the Consultant has satisfied the requirements of paragraph 8.2.10, and;
b) make any procedural order considered necessary to facilitate the addition of the Consultant as a party to the arbitration.

8.2.14 The provisions of paragraph 8.2.9 shall apply mutatis mutandis to written notice to be given by the Consultant to any sub-consultant;

8.2.15 In the event of notice of arbitration given by the Consultant to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.2.10, and is deemed to be bound by the arbitration proceeding."

GC 9.1
Protection of Work and Property

.1 Delete sub-para. 9.1.1.1 in its entirety and substitute new sub-para.: "9.1.1.1 errors in the Contract Documents which the Contractor could not have discovered applying the standard of care described in para. 3.14.1;"

.2 Delete para. 9.1.2 in its entirety and substitute the following new para.: "9.1.2 Before commencing any Work, the Contractor shall determine the locations of all underground utilities and structures indicated in or reasonably determinable from the Contract Documents, or that are reasonably determinable from an inspection of the Place of the Work exercising the degree of care and skill described in paragraph 3.14.1."

.3 Add para.: "9.1.5 The Contractor shall be responsible for keeping the Work free from trespassers and for protection of Work and the public from any loss or injury directly or indirectly caused by the Work from commencement to completion of the Work."

GC 9.2
Toxic and Hazardous Substances

.1 Add to para. 9.2.6 after the word "responsible", the following new words: "or whether any toxic or hazardous substances or materials already at the Place of the Work (and which were

then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor of anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,"

.2 Add "and the Consultant" after the word "Contractor" in sub-para. 9.2.7.4.

.3 Add to para. 9.2.8 after the word "responsible", the following new words: "or that any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,"

.4 Add "and the Consultant" after the word "Owner" in sub-para. 9.2.8.4.

GC 9.4
Construction Safety

.1 In para. 9.4.1, delete the first line of this para. so that the para. commences: "The Contractor shall be solely...".

.2 Add para.: "9.4.2 For Purposes of the Occupational Health and Safety Act, the Contractor for this project shall be designated the "Constructor" and shall assume the responsibilities of the constructor as set out in the Act and its Regulations."

GC 9.5
Mould

.1 Add "and the Consultant" after "Owner" in subparagraph 9.5.2.4.

.2 Add " and the Consultant" after "Contractor" in subparagraph 9.5.3.4.

GC 10.1
Taxes and Duties

.1 Add sub-para.: "10.1.2.1 For the purpose of determining the adjustment in the Contract Price by virtue of any changes in

any tax or duty described above; where such tax is changed after the date of submission of the bid by the Contractor but public notice of such change has been given by the competent legislative body before the date of submission of the bid, the changes of such tax or duty, for the purposes of this article, shall be deemed to have occurred before the date of submission of the bid."

GC 10.2
Laws, Notices,
Permits and Fees

.1 Delete from the first line of para. 10.2.5 the word, “The” and substitute the words: “Subject to para. 3.14.1, the”.

.2 Add sub-para.: “10.2.7.1 For the purpose of determining the adjustment in the Contract Price by virtue of any changes in any law, ordinance, rule, regulation, or code described above; where such law, ordinance, rule, regulation, or code is changed after the date of submission of the bid by the Contractor but public notice of such change has been given by the competent legislative body before the date of submission of the bid, the changes of such law, ordinance, rule, regulation, or code for the purposes of this article, shall be deemed to have occurred before the date of submission of the bid."

.3 Add para.: "10.2.8 Notwithstanding the requirements of GC 10.2.5, the Specifications make reference to the Ontario Building Code 2006, O. Reg. 350/06 as amended and CMHC Residential Standards as minimum standards of workmanship and materials. Such standards form part of the Specifications for the Work and establish the minimum quality of work and materials for the project. Where requirements of the Contract Documents exceed these minimum code standards, perform the Work in strict accordance with the additional requirements of the Contract Documents."

GC 10.4
Workers' Compensation

.1 Add para.: "10.4.3 The Contractor shall at all times pay, or cause to be paid, any assessment or compensation required to be paid pursuant to the Workplace Safety & Insurance Act, and upon failure so to do, the Owner may pay such assessment or compensation to Workplace Safety & Insurance Board, and deduct or collect such expenses under the provisions of these conditions."

GC 11.1

Insurance

.1 In para. 11.1.2, delete the words “if required,”

.2 Read that the limits shall not be less than five million dollars in each of para. 11.1.1.1, 11.1.1.2 and 11.1.1.3.

.3 To para 11.1.1, sub-para. .1, after the words “6 years following Substantial Performance of the Work” add the following “, and the Contractor shall annually provide to both the Owner and the Consultant proof of such insurance.”

GC 11.2
Contract Security

.1 Add sub-para.: "11.2.1.1 The Contractor shall on award of the Contract and prior to signing the Contract, provide and pay for a Performance Bond in the amount of 50% of the Contract Price covering the performance of the Contract."

.2 Add sub-para.: "11.2.1.2 The Contractor shall on award of the Contract and prior to signing the Contract, provide and pay for a Labour and Material Payment Bond in the amount of 50% of the Contract Price covering labour and material of the Contract."

.3 Add para.: "11.2.3 All legal, accounting, architectural, engineering and other Consultants’ expenses, watchmen's services, heat, light, power and other related expenses, incurred by the Owner as a result of the interruption of the Work and of the Contractor's default shall be covered by these bonds."

.4 Add para.: "11.2.4 The Contractor shall inform the bonding company of any changes to the Contract and ensure that the validity of the bond is maintained."

GC 12.1
Indemnification

.1 Add “and the Consultant” after the words “hold harmless the other” in para. 12.1.1.

GC 12.3
Warranty

.1 Add at end of para. “12.3.1, or those periods specified in the Contract Documents for certain portions of the Work or Products”. Work completed after Substantial Completion shall be warranted for one year from the date of acceptance of that work, or as otherwise provided in the documents.

.2 Delete from the first line of para. 12.3.2 the word, “The” and

substitute the words: "Subject to para. 3.14.1, the .....".

.3 In para. 12.3.3 delete the words "one year".

.4 Delete para. 12.3.6 in its entirety and substitute new para. 12.3.6, 12.3.7, and 12.3.8:
"12.3.6 Any extended warranties required beyond the one year period as described in para. 12.3.1 shall be as specified in the Contract Documents."
"12.3.7 the Contractor shall be responsible for obtaining Product Warranties in excess of one year on behalf of the Owner. The obligations under such extended Product Warranties are solely the responsibilities of the warrantor."
"12.3.8 Prior to the expiry of the Warranty period, the Owner reserves the right to carry out a detailed and exhaustive inspection of the Work with regard to all Work performed under the Contract."

PART 13 - MISCELLANEOUS

Add:
"GC 13.1
Construction Lien Act

.1 13.1.1 The Contractor shall pay promptly when due, all costs for work done or caused to be done by the Contractor at the Place of the Work which could result in any lien or encumbrance on the Owner's interest in the Project.

.2 13.1.2 The Contractor shall, at the Contractor's own cost, forthwith cause any and all construction liens and other liens for labour, service or materials arising in respect of performance of the Work by the Contractor's subcontractors or suppliers to be paid, satisfied, released, discharged or vacated.

.3 13.1.3 The Contractor hereby agrees to indemnity and hold the Owner harmless in respect of any costs, losses, or damages, that the Owner may suffer or incur as a result of any such liens, including without limitation, all reasonable Consultant fees, other expenses and legal costs for advising the Owner and assisting the Owner with respect to the response to or removal of any such liens.

.4 13.1.4 Where the Owner responds to any proceeding taken under the Construction Lien Act, whether it is caused by the act or omission of the Contractor or otherwise, the Owner may set off against any amount owing to the Contractor all the Owner's expenses referred to in Supplementary Condition 13.1.

.5 13.1.5 The Contractor shall immediately notify the Owner of any lien, notice of lien, claim for lien or other action of which the Contractor has or reasonably should have knowledge of and which affects the title to the Project or the Owner's responsibilities or liabilities under the Contruction Lien Act.

.6 13.1.6 Upon receipt by the Owner of a written notice of lien, which does not set out the amount, all payments shall be stopped until the amount is quantified and/or is withdrawn or the Construction Lien Act is otherwise complied with.

.7 13.1.7 Upon the registration of any Claim for Lien or Certificate for Action against the title to the Project, all payments by the Owner to the Contractor shall be stopped until such time as any registered liens shall have been vacated.

.8 13.1.8 Where a lien or Certificate of Action is vacated the Contractor shall provide to the Owner true copies of the court order, other relevant documentation, and other documentation requested by the Owner.

.9 13.1.9 When required by the Owner, the Contractor shall provide, or cause to be provided to the Owner, sub-contractors' and suppliers':

- Declarations of Last Supply
- Names, addresses, telephone and facsimile numbers
- Principal contact person
- WSIB account numbers
- WSIB Clearance Certificates."

END OF SECTION

1.
Examination

.1 The Contractor and all Subcontractors shall familiarize themselves with conditions at the site. Each one shall bear complete responsibility for familiarization with conditions and the affect that same may have on Work.

.2 Every Subcontractor and the Contractor shall examine the Contract Documents, the conditions on site and the work in place prior to commencing the various portions of his Work.

.3 Each Subcontractor and the Contractor shall report in writing to the Consultant and the Contractor any defects affecting the work of that trade.

.4 Commencement of work shall be construed as evidence of acceptance of underlying surfaces, conditions, arrangement and location as satisfactory.

2.
Supervision

.1 The overall superintendence of the project, ensuring the complete performance of all Subcontractors and Suppliers as laid down in the specifications, is the responsibility of the Contractor. A fully competent site superintendent acceptable to the Architect shall be in charge of the work at all times throughout the Contract. The Superintendent shall study the plans and specifications in detail and be completely familiar with the project at the outset. Once conversant with the documents, the Site Superintendent shall relate them to the existing conditions. Any errors or discrepancies in dimensions, details, etc., in the plans and specifications or their relationship to the existing conditions shall be reported to the Architect for clarification or correction before beginning the work. Allow Architect time for clarification or correction as required.

.2 Ensure that all necessary job dimensions are taken and all trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.

.3 Verify that all work as it proceeds is executed in accordance with dimensions and positions indicated, which maintain levels and clearances to adjacent work as set out by requirements of the drawings; and ensure that work installed in error is rectified before construction continues.

.4 Check and verify all dimensions referring to the work and the interfacing of all services. Verify with the trade concerned all

dimensions pertaining to the work of other trades.

.5 Any errors, discrepancies, or trade conflicts arising during construction shall, when necessary, be referred to the Architect for clarification and/or decision. Allow Architect time for deliberation as required.

3. Cooperation and Coordination

.1 Coordinate all Subcontractors and Suppliers so that work proceeds smoothly without interruption and in strict accordance with approved schedules. Cooperation so that work is executed in proper sequence, items to be built-in are built-in on time, erected work is protected against damage from the work of other trades and defective work is removed and made good to the satisfaction of the Architect.

.2 Study all documents which describe, or are related to, any operation before commencement of that operation. Report discrepancies discovered between elements of documentation and obtain ruling on required interpretation before beginning work. Allow Architect time to make ruling as required.

.3 Ensure that material, equipment, services and operatives are brought to site at proper times, in sufficient quantity and quality and in accordance with requirements of work.

.4 Contractor shall ensure that each Subcontractor informs him of requirements for site conditions and surfaces necessary for the execution of the work and that he provides setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels. The Contractor shall inform other Subcontractors whose work is affected by these requirements and preparatory work.

.5 Contractor and Subcontractors shall cooperate fully with other contractors and subcontractors working on this project. Perform necessary coordination to install equipment supplied, or supplied, or supplied and installed by Owners.

.6 Remove and replace ceilings as required to accommodate the installation by other contractors of phone, data, security and other service lines in ceiling space.

4.
Contractor's Use of Site

.1 Use of site: Exclusive and complete for execution of the Work and as otherwise noted or indicated. Use of site will change with each Phase of the Work. Site protection to be altered for each Phase as required to provide required safety and for the operation of the building.

.2 Confine operation, storage, access and parking to construction areas as indicated and directed. Coordinate and cooperate with users.

.3 Do not unreasonably encumber site with materials or equipment.

.4 Move stored products or equipment which interfere with operations of Owner or other contractors.

.5 Obtain and pay for use of additional storage or work areas needed for operations.

.6 Maintain project grounds and public properties free from accumulation of waste materials and rubbish.

5.
Documents Required

.1 Maintain at job site copies of contract drawings, specifications, addenda, regulatory authority approved drawings, permits and certificates, reviewed shop drawings, contemplated change orders, change orders, change directives, supplemental instructions, other modifications to Contract, field test reports, inspection reports, job minutes, approved schedule, manufacturers' installation and application instructions, Material Safety Data Sheets, set of drawings for record drawings, OHS Act and regulations for construction projects.

.2 Provide, in a timely manner, copies of Consultants' site review reports, supplemental instructions and change orders to municipal building inspectors.

6.
Job Meetings

.1 Hold job meeting at times, frequency, and locations approved by Architect. Notify all parties concerned of meetings. Ensure Subcontractors attend.

.2 Record minutes of meetings and distribute to Subcontractors, Owner and Consultants within three (3) Working Days of meeting.

7. Inspection, Tests and Approval

.1 At least one (1) full working day's notice shall be given to the Architect in order that all inspections and tests called for by these specifications may be implemented. Failure to give such notice will result in complete retesting if deemed necessary by the Architect. No work shall be covered up until inspection and approval by the Architect or Inspector.

8. Building and Other Permits

.1 The Building Permit has been applied, paid for and will be obtained by the Owner.

.2 Provide Authorities with such plans and information as may be required for the issuance of Acceptance Certificates.

.3 Obtain all Inspection Certificates required by Authorities having jurisdiction. Hand over copies of same to Architect.

.4 Contractor shall obtain and pay for all other permits required for the Work.

9. Setting Out Lines and Levels

.1 Contractor shall confirm all elevations and/or dimensions of existing conditions on site and allow for same in tendering price.

.2 Employ qualified Ontario Land Surveyor to establish and layout in the field all grid lines, exterior wall and other main lines and levels, verify known geodetic elevation, establish bench marks or permanent monuments and correlate geodetic elevations with public utility elevations.

.3 Verify and record on the record drawings: elevations of footing, bearing surfaces, tops of footings, new services, existing utilities encountered; all related to finished floor elevation or geodetic elevations.

.4 Install substantial batter boards, lines, stakes, etc., as required during the progress of the work.

10.
Cutting and Patching

.1 Execute cutting (including excavation), fitting and patching required to make the work fit properly together. Cut and patch for mechanical and electrical work.

.2 Coordinate work with other trades so that there is a minimum of cutting, fitting and patching.

.3 Drilling, cutting, fitting and patching and making good where necessary due to failure to deliver items to be built in time or installation in wrong location, shall be executed as directed at no cost to the Owner.

.4 Drilling and cutting of load bearing structural members shall be done on prior express written permission of the Architect for each instance.

.5 Cut holes accurately, with smooth, true, clean edges. Fit units to tolerances specified or shown or, if not noted, to best standard practice for applicable work. Patched work shall be invisible. Size holes and openings for pipes so as to allow for expansion and contraction of such pipes.

.6 Employ tradesmen skilled in the work and execute work to standards specified for that work on this project.

.7 Patch new work as required to maintain integrity of fire separations, ratings and assemblies. Patch new work as required to maintain air and moisture tightness of construction.

.8 Slab Scanning:
.1 Before cutting or drilling existing concrete floors (and walls), scan area of proposed cut to locate all metallic and non-metallic pipes, conduits, cables and rebar in concrete and below slabs-on-grade.
.2 Route new services so that required cutting and drilling will not damage existing concealed services or structural reinforcing steel.
.3 Use GPR technology suitable for the assembly, supplemented by other methods where necessary, to fully locate concealed elements.
.4 Where interferences occur, inform Consultant to obtain direction for relocation of proposed services.
.5 Contractor shall provide confirmation of scanning to the

Owner and Consultant prior to proceeding with the work, and shall adjust approach as required to minimize the risk of damage to any services.

.6 Contractor is responsible to repair any damage caused by non-performance of the above noted procedures.

11. Overloading

.1 Ensure no part of the Work is subjected to loading that will endanger its safety or will cause permanent deformation.

.2 Be solely responsible and liable for resulting damages.

.3 Provide temporary supports to Consultant's approval.

.4 Do not place loads on concrete floors until they have obtained their 28 day design strength.

12. Concealment

.1 Conceal pipes, ducts, and wiring in floor, wall and ceiling construction except where indicated otherwise on architectural drawings.

.2 Install and arrange duct, piping, tubing, conduit, equipment and fixtures in such a way as to conserve headroom and space as much as possible, to provide minimal interference and to be neat, orderly and tidy. Unless otherwise noted, run pipe duct, tubing, conduit vertical, horizontal and square with building grid.

13. 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 Architect of impending installation and obtain his approval for actual location.

14. Coordination Drawings

.1 Prepare coordination drawings of installation for efficient use

of available space, for proper sequence of installation, and to resolve conflicts including at congested areas and where unforeseen conditions encountered. Show:
.1 Relative portions of various components, services and equipment.
.2 New and previously installed work.

.2 Prepare for review prior to commencement of the work in area.

.3 Submit in accordance with Section 01 30 00.

15. Inserts, Sleeves and Anchors

.1 Provide all sleeves, inserts, anchors, hangers, supports, adhesives and the like necessary for execution of the work.

.2 Co-ordinate work with other trades. Arrange and pay for installation of sleeves, inserts, anchors, etc. by appropriate trade.

.3 Employ workmen skilled in the work and execute work to the standards specified for that work on the project.

16. Public and Private Utilities and Services

.1 Verify limitations imposed on the Work by presence of public and private utilities and services (including wiring), and ensure no damage occurs to them.

.2 Use licenced and insured underground services locating firms to locate all public and private underground services.

.3 Notify service authorities concerned so that they protect, remove, relocate, or disconnect them as they may require.

.4 Make arrangements and pay for connection charges for services required for the Work.

.5 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

17. Survey Pins

.1 Property markers, iron pins and square iron pins, bars, etc., disturbed or lost in the course of construction shall be replaced by an Ontario Land Surveyor at no cost to the

Owner.

18.
Rubbish

.1 Do not burn or bury rubbish and work materials on site.

.2 Dispose of rubbish and surplus material off site.

.3 Do not dispose of volatile or corrosive materials in sewers and drains.

.4 Dispose of waste in a manner not detrimental to public, private or Owner's property, or to any portion of the Work completed or under construction.

.5 Remove sediments, suspended solids, pollutants or other materials which would degrade or impair water or soil quality before disposing of waste water.

.6 Except as otherwise noted, materials indicated for removal become the Contractor's property and shall be taken from the site.

.7 Dispose of rubbish and waste in accordance with governing regulations.

19.
Recycling

.1 In accordance with Ontario Regulation 102/94;
.1 Conduct a solid Waste Audit before construction begins;
.2 Prepare a solid Waste Reduction Workplan and post summary visible to all workers.

.2 In accordance with Ontario Regulation 103/94:
.1 Establish Source Separation Programs to collect, handle and store;
- brick, concrete block and concrete
- corrugated cardboard
- wood
- drywall
- steel

.2 Ensure;
- use of programme
- that materials are recycled
- that workers are instructed on how to source separate, what is to be collected, and in what form materials will be collected.

.3 Submit record copy of solid Waste Reduction Workplan to Consultant within 21 days of Contract award.

20.
Occupancy Permit

.1 Prior to Owner's occupancy of the Work, or part of the Work, apply, pay for, obtain and submit to the Owner Temporary Occupancy Permits as required by the phasing of the Work.

.2 Prior to Substantial Performance, obtain and submit to the Owner an Occupancy Permit for the Work.

.3 All sprinklers, emergency light, power systems, fire separation assemblies and closures, barrier-free facilities, as well as other items required by the Authorities having jurisdiction shall be provided, operating satisfactorily, certified and licensed prior to any occupancy.

END OF SECTION

1.
General

.1 Inclusion of Allowances in Tender Price is not to be construed as implying that any or all the Allowances will be expended.

2.
Inspection and
Testing Allowance

.1 Inspection and testing will be carried out under cash allowances carried by the Owner . Inspection services invoices will be paid by Owner directly and the costs assigned to this allowance.

.2 Inspection and Testing Allowance cover only net cost for inspection and testing services provided by independent testing companies. Include in Contract Price all costs associated with testing services, including provision of materials, coordinating assistance, overhead and profit, and other costs listed in Para. 3.3 governing Cash Allowances.

.3 Refer to Section 01 45 00, Quality Control and the following sections of the specifications for further details:
.1 Section 03 10 00 Bearing Inspection and Compaction Tests
.2 Section 03 30 00 Concrete Tests
.3 Section 05 12 00 and 05 21 00 Structural Steel and Joists
.4 Section 07 52 00 Roofing Inspection

3.
Cash Allowances

.1 Cash allowances cover only the net cost to the Contractor of the items, materials, services or contract referred to, as verified by invoices to be submitted.

.2 Cash Allowances for the following are carried by the Owner and are not to be included in the Contract Price:
.1 Interior Signage and Exterior signage.
.2 Security system alterations.

END OF SECTION

1.
General

.1 Base the Work of this Contract and the Contract Price upon using new materials and products specified.

.2 Where materials and products are specified only by reference to standards, provide any material or product which meets the standard.

.3 Products specified by their proprietary names or by part or catalogue number shall form the basis for the Work. No substitutes for these may be used without the Consultant's approval in writing.

.4 Where a material or product is specified by naming two or more acceptable materials or proprietary products, provide any one of the specified materials or products. If compliance with a referenced standard is also specified, the material or product selected shall meet the standard.

.5 Substitutions will be considered only when submitted in sufficient time to permit proper investigation by the Consultant, and under the conditions specified herein.

.6 There is no obligation on the part of the Consultant of Owner to review or accept proposed substitutions.

.7 Materials and products specified without a "or other approved manufacturer" or a "or approved equal" clause, following the name of the specified material or product, shall be provided without request for substitution.

.8 Where the specifications include a "or other approved manufacture" or "or approved equal" clause, substitutions proposed with tender submission or after award of Contract will be considered only under the following conditions:
.1 if the materials and products specified are not available; or
.2 if substitute materials and products to those specified, which are brought to the attention of and considered by the Consultant as equivalent to those specified, will result in a credit to the Contract Price; or
.3 if substitute materials and products to those specified, which are brought to the attention of and considered by the Consultant as superior to those specified, will not increase the Contract Price; or
.4 if substitute materials and products to those specified will not substitute a product manufactured outside Canada for a Canadian made product; or

.5 if a material or product is specified together with a requirement for performance and, in the opinion of the Contractor, the specified material or product will not produce the required results; or

.6 when a substitution is otherwise advantageous to the Owner or to the execution of the Work, as determined by the Consultant.

.9 Substitutions proposed shall comply with the following requirements:

.1 When proposing substitutions, submit with each application the material and product names and complete specifications substantiating compliance of the proposed substitution with the requirements of the Contract Documents including:

- .1 product identification;
- .2 detailed, item-by-item comparison between the properties and characteristics of the specified material or product and the proposed substitution;
- .3 manufacturer's name, address and telephone number;
- .4 manufacturer's literature;
- .5 performance, technical and test data;
- .6 reference standards;
- .7 product limitations;
- .8 samples;
- .9 list of existing installations;
- .10 changes to the Contract Time;
- .11 changes to the Contract Price.

2. Should the proposed substitution be accepted either in part or in whole, the Contractor assumes full responsibility when the substitution affects any other part of the Work.

.3 When proposing substitutions, satisfy all design conditions and other specified requirements. Properties including but not limited to the following, as applicable, will be considered:

- .1 physical dimension requirements to satisfy the space limitations;
- .2 static and dynamic weight limitations;
- .3 structural properties;
- .4 audible noise levels;
- .5 vibration generation;
- .6 interchangeability of parts or components;
- .7 accessibility for maintenance;
- .8 possible removal or replacement;
- .9 colours and textures;
- .10 compatibility with other materials, products, assemblies and components.

.10 Ensure that substitutions are accommodated by space allotted for the specified materials, products, methods or processes.

.11 Be responsible for the cost of changes in the work of all trades necessitated by the use of proposed substitutions.

.12 Be responsible for substitutions to methods or processes concerning such work, and ensure that the warranty covering all parts of the Work is not affected.

.13 Substitutions shown on shop drawings which have not been accepted through the process described in this Section will be rejected whether shop drawings have been reviewed or not.

.14 Substitutions which require changes to the Contract Documents will not be considered unless agreement exists between the Owner and the Consultant to compensate the Consultant for costs required to execute such changes.

.15 Materials, appliances, equipment and other products are sometimes specified by reference to brand names, propriety names, trademarks or catalogue number or catalogue designation or symbols. In such cases, the name of manufacturer, distributor, supplier or a dealer is sometimes given to assist the Contractor to find a source of supply. The naming of a source of supply does not relieve the Contractor from their responsibility for finding his own source of supply even if the source named no longer supplies the product specified. If the Contractor is unable to obtain the specified product, he/she shall supply a substitute product of equal to or better than the specified product, as acceptable to the Consultant, with no extra compensation. Should the Contractor be unable to obtain a substitute product equal to or superior than the specified product and the Owner accepts an inferior product, the Contract Price shall be adjusted accordingly, as acceptable to the Consultant.

2.
Substitutions
for Code Requirements

.1 Ensure that proposed substitutions for materials, products, methods and processes meet the requirements of the applicable building code and other requirements of authorities having jurisdiction.

.2 Ensure that proposed substitute materials, products, methods and processes do not negate the compliance of adjacent materials, products and constructions with the requirements of the applicable building code and other requirements of authorities having jurisdiction, to which the proposed substitutions may be applied or attached.

.3 Obtain written approval of proposed substitutions from the authority having jurisdiction and submit the approval with the proposed substitution for the Consultant's consideration.

3. Credits Arising from Substitutions

.1 Credits arising from accepted substitutions will be credited to the Contract in such sums as may be agreed upon between the Owner and the Contractor after being assessed by the Consultant, and the Contract Price will be adjusted accordingly. No substitutions will be permitted without the prior written approval of the Consultant.

4. Mechanical-Electrical Manufacturers

.1 If materials or apparatus manufactured and/or supplied by a manufacturer is other than the manufacturer upon which the design is based, ensure that the other material or apparatus is equivalent in performance and operating characteristics to the materials or apparatus upon which the design is based, and pay costs for larger starters, additional space, larger power feeders and changes to associated or adjacent work. In addition, in mechanical and electrical rooms where the apparatus is used in lieu of apparatus upon which the design is based and the dimensions differ from the apparatus upon which the design is based, prepare and submit for approval, accurately dimensioned layouts of rooms affected.

END OF SECTION

1.
General

.1 Refer to General Conditions and Supplementary Conditions for additional contractual information concerning submittals.

.2 Refer to individual sections of specifications, Division 02 to 48, for detailed information on submittal requirements.

.3 Schedule submissions at least two (2) weeks before dates reviewed submission will be needed.

.4 Do not proceed with work until relevant submissions are reviewed.

.5 Submittals which have not been requested will be returned to the Contractor with no action taken by the Consultant. Submittals to which the Consultant's standard "Received" stamp is affixed have not been reviewed by the Consultant.

2.
Identification of Submittals

.1 Identify each submittal made with project, Owner's, Architect's, Contractor's, Subcontractor's and Supplier's name. Indicate origin and intended use in work. Submittal to be accompanied by transmittal letter recording the above information. Samples to be permanently identified with the same information.

3.
Documentation Required
Before Construction Start

.1 Insurance Forms

.2 Performance Bond and Labour & Material Payment Bond as called for.

.3 WSIB Clearance Certificate.

4.
Statutory Declaration

.1 Submit, with second and each subsequent application for payment a Statutory Declaration on the applicable CCDC 9-2001 form.

5.
WSIB Clearance Certificates

.1 Submit with each monthly progress claim, Workplace Safety and Insurance Board Clearance Certificate.

.2 Should the successful tenderer be registered as a Schedule 2 employer under the Workplace Safety and Insurance Act, the successful bidder shall provide written confirmation from the Workplace Safety and Insurance Board that it has complied with the requirements of the Workplace Safety and Insurance Act and that it is in good standing with the Workplace Safety and Insurance Board. The successful tenderer is required to notify the Board of any material change in circumstances in connection with their obligations under the Act within ten days after the material change occurs.

6.
Construction Schedule

.1 Within fourteen (14) days of authorization to proceed, submit six (6) copies of proposed construction schedule for Architect's approval.

.2 Schedule shall be in a format acceptable to the Architect and the Owner. Show clearly proposed progress of all main items. Indicate each trade or operation separately. Order chronologically for beginning of each item of work. Identify first workday of each week. Identity critical sequence of work.

.3 Include or show separately shop drawing review, decision dates for allowances, fabrication and delivery lead time. Show dates for beginning and completion of each element of construction including subtrade work, concrete placement, equipment installation and testing.

.4 Include or show separately delivery dates for equipment and materials which have a critical delivery period.

.5 Identify work of separate blocks or phases, or other logically grouped activities. Show projected percentage of completion for each item of work at least as frequently as of 1st and 15th day of each month.

.6 Predicate schedule on basis of Substantial Performance prior to date stated in agreement.

.7 Provide commissioning schedule (including start up) for all mechanical and electrical systems, prior to Substantial Performance.

.8 Revise or elaborate on schedule if requested by Architect and submit 6 copies of approved schedule for distribution to Owner.

.9 Revise and update schedule weekly during construction, and provide copy of updated schedule to the Architect and Owner weekly.

7.
Schedule of Values

.1 Conform to GC 5.2 and relevant Supplementary Conditions.

.2 Itemize separately: individual sections of specifications, different phases of the work, bonds, permits, mobilization, field supervision and layout, temporary facilities and controls, major equipment, material costs delivered, installation costs, each allowance, clean up, maintenance manuals, record drawings hand over and commissioning.

.3 Submit for approval of Owner and consultant at least fourteen days prior to first application for payment.

8.
Shop Drawings
& Product Data

.1 Submit shop drawings for Architect's review in accordance with GC-3.10.

.2 For non-custom items of equipment, manufacturer's publications or catalogue excerpts are acceptable if suitably annotated in ink.

.3 Submit one copy, full sized only, to Consultant.

.4 E-mailed submissions are acceptable. PDF didgital format is the only acceptable format. Shop drawings and transmittals submitted in other formats will be returned without being reviewed. Compliant transmittals and cover pages should be included in PDF file. Email will not be accepted as transmittal. Faxed submission are not acceptable.

.5 Shop drawings shall be dated and contain name of project, description or names of material and items and complete identification of locations of which materials are to be installed.

.6 Accompany shop drawings by transmittal letter containing project name, Contractor's name, number of drawings, titles, description of drawings, and other pertinent data.

.7 Shop drawings submitted which have not been thoroughly reviewed, coordinated, stamped, dated and signed by a responsible person in Contractor's office will be returned without review for resubmittal.

.8 Present submittals in SI metric units; if not produced in metric convert all values.

.9 Individual submissions will not be reviewed until all related information is available. Incomplete submission will be rejected and returned to Contractor and Contractor may be charged for Consultant's time and expense involved.

.10 Show in complete detail, items to be provided and their relation to structure or area in which they are to be installed. Note related items not intended to be supplied as part of the Work of the trade concerned. Clearly note all dimensions and detail methods of fastening.

.11 Delete product data information not relevant to project.

.12 Supplement standard information to provide details applicable to project.

.13 Reproduction of Contract Drawings not permitted.

9.
Samples

.1 Submit samples requested in various sections of specification and as may be reasonably required by Architect.

.2 Submit samples of adequate size and range of colours or textures to represent material in intended use on project.

.3 Unless the precise colour and pattern is specifically described in the Contract Documents, wherever a choice of colour or pattern is available in a specified product, submit accurate colour and pattern charts to the Architect for selection.

.4 Material used on project shall match approved samples for quality, colour and texture, finish and performance. Do not proceed with work until samples are approved.

10.
Mock-Ups

.1 Mock-Up: Field erected example of work complete with specified materials and workmanship.

.2 Provide mock-ups requested in various sections of specifications and as may be reasonably required by the Consultant.

.3 Erect mock-ups at locations acceptable to Consultant.

.4 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.

11.
Record Drawings

.1 Maintain Contract Drawings at site office for record purposes. Record accurately deviations from Contract Documents caused by site conditions, change orders, site instructions, and addenda. Mark in red ink.

.2 Include depth of various elements of foundation, horizontal and vertical location of new, maintained, rerouted and abandoned underground utilities and of utilities concealed in construction. All unseen or hidden components must be located by dimension.

.3 Ensure that drawings are updated weekly and in good condition at all times.

.4 Submit record drawings to Architect just prior to Substantial Completion.

.5 Consult Divisions 21 to 48 for other particular requirements.

12.
Progress Reports

.1 Contractor shall prepare daily reports of his operations. Daily report shall contain at least the following information:
- weather conditions
- manpower on the job in each trade
- major items of equipment on the job
- a brief summary of work accomplished that day
- materials, equipment, or owner-furnished items arriving or leaving site

- inspection reports
- significant events
- any tests made and their final results, if known
- any oral instructions received
- visitors to the job

.2 Contractor shall maintain a file of copies of all daily reports on the site and make it available to Consultant or Owner upon request.

13.
Manuals of Instruction
and Maintenance

.1 Prior to substantial performance inspection, submit to Architect three (3) copies in English of Instruction and Maintenance Manuals as follows:
.1 Bind data in 8½" x 11", vinyl covered three-ring loose-leaf binders.
.2 Enclose title sheet, labelled "Instruction and Maintenance Manual" with project name, list of contents, date and names of Owner, Architect, and Contractor.
.3 Organize contents into applicable sections of work to parallel project specification breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.

.2 Neatly type lists and notes. Use clear drawings, diagrams or manufacturer's literature.

.3 Contents:
.1 As called for in individual sections of these specifications.
.2 Maintenance instructions for exterior and interior floor, wall, and ceiling surfaces as well as all installed fittings as printed by manufacturer.
.3 Operating and maintenance instructions for mechanical and electrical equipment called for in Division 21 and 28, bound separately.
.4 Colour schedule; hardware schedule.
.5 Copies of all guarantees and warranties.
.6 Complete set of final approved shop drawings, bound separately, indicating corrections and changes made during fabrication and installation.
.7 Names, addresses, and phone numbers of Subcontractors and suppliers.
.8 WHMIS Manual described in Section 01 59 00.

14.
Maintenance Materials

.1 Turn over materials and spare parts called for in various sections of specifications to Owner's authorized representative and obtain receipt. Submit receipt to Architect.

.2 Submit materials in unbroken cartons or if not available in cartons, strongly packed. Identify colour, room number, unit number or area materials used.

.3 Provide tools with identifying tag reference. Identify equipment or system for which tools are applicable and provide instructions for use.

.4 Identify spare parts with part number, equipment or system for which parts are applicable. Provide installation instructions and name of supplier.

15.
Documents Required Before Substantial Performance

.1 Documents required prior to Substantial Performance include:
- .1 Record Drawings.
- .2 Manuals of Instruction and Maintenance including:
  - .1 Warranties.
  - .2 Final approved shop drawings.
  - .3 Schedules.
  - .4 WHMIS Manual.

END OF SECTION

1. General

.1 Specific testing & inspection requirements are outlined in various sections of specifications.

2. Appointment

.1 Owner shall appoint an independent testing company or companies to conduct tests and/or perform inspections of materials and workmanship under this contract.

3. Other Testing

.1 Where no testing requirements are specified but Owner decides that testing is required, Owner reserves right to have such testing or inspections performed.

.2 Payment for extra testing requested by Owner shall be an addition to the Contract as outlined in GC6, Changes in the Work.

4. Scheduling

.1 Notify Architect at outset of project of requirements for testing services so that requisite testing and inspection activities can be coordinated into work on schedule.

5. Notification

.1 Notify Architect two weeks in advance of date when the first work will be ready for inspection.

.2 Notify testing company at least 24 hours before such inspection or test is required.

.3 When testing laboratory is ready to test according to the above notification, but is prevented from testing or taking specimens due to incompleteness of work, all extra costs for testing attributable to the delay shall be deducted by Owner from Contract Price.

6. Cooperation

.1 Provide representatives of testing company with access to work at all times. Permit testing laboratory to take materials and specimens required for testing and assist as requested. Deliver samples of material to testing company as specified.

.2 Make good work disturbed by inspection and test.

7. Reports

.1 Testing company shall promptly issue test reports simultaneously and directly to Contractor (1 copy), Owner (1 copy), Architect (1 copy), Engineer (1 copy).

8. Failure to Meet Requirements

.1 Non-compliance: When initial tests indicate non-compliance with contract documents, costs of initial test associated with non-compliance shall be deducted by Owner from Contract Price.

.2 Re-testing: When initial tests indicate non-compliance with the contract documents, all subsequent re-testing occasioned by non- compliance shall be performed by same testing company and costs thereof deducted by Owner from Contract Price.

9. Contractual Responsibility

.1 Review of construction by the Consultant and inspection and testing by an independent Inspection and Testing Agency, are precautions against oversight or error. They do not relieve Contractor of his contractual responsibilities. Review, inspection, and testing, are based on representative samples of the work and do not relieve the Contractor from carrying out his own quality control and for completing all work in accordance with contract documents.

.2 Costs for uncovering and making good work that is covered before required inspection or testing is completed and approved, are the Contractor's responsibility.

.3 Contractor shall furnish all labour and facilities and be responsible for:
.1 Inspection and testing required by laws, ordinances, rules, regulations or order of public authority.
.2 Inspection and testing performed exclusively for Contractor's convenience.
.3 Testing, adjustment and balancing of conveying mechanical and electrical equipment and systems.
.4 Mill tests and certificates of compliance.
.5 Tests specified to be carried out by the Contractor.

END OF SECTION

1. Construction Offices

.1 Provide weather tight office to accommodate construction meetings, drawing lay-down table, drawing storage rack, filing cabinet, and first aid equipment, coat hooks, meeting table and chairs.

.2 Provide and pay for adequate heat, light and ventilation.

.3 Provide and pay for site supervisor's telephone, answering machine, fax machine and calls until Total Performance. Provide fax machine on site until occupancy. Telephone, fax and Internet to be on separate lines.

.4 Keep clean and orderly. Do not use for storage of construction materials.

.5 Make available for use by Owner and Consultants at all times.

2. Storage Sheds

.1 Provide and maintain, in approved locations on site, temporary offices and sheds for storage of materials, tools and equipment. Construct temporary buildings with raised floors, weatherproof, of neat appearance and subject to Architect's approval.

.2 Store materials and equipment in areas on site designated by Architect.

.3 Do not use space within existing building to store combustible or flammable materials.

3. Sanitary Facilities

.1 Provide temporary lavatory accommodation and sanitary conveniences, in accordance with Provincial and Municipal regulations, for use of all workers. Keep clean.

4. Hoarding

.1 Provide temporary hoarding or fencing wherever required by applicable codes, by-laws and as shown on drawings.

.2 Construct fencing/hoarding and other protection at least to municipal and provincial standards.

5. Enclosure

.1 Provide temporary enclosures as required by construction

operations and to ensure continuous execution of the Work.

.2 Provide temporary weathertight enclosures and protection for exterior openings until permanent exterior doors, windows and roof closures are installed.

.3 Design enclosures to withstand wind pressure.

6. Services

.1 Existing power, lighting, water supply are available for use of all trades as required to perform the Work, at no cost.

7. Service Shut Downs

.1 Give the Consultant and Owner two (2) Working Days notice related to each pre-scheduled interruption of any mechanical or electrical service throughout the course of the Work. Schedule new interruptions so as to provide Owner with 5 Working Days notice. Keep duration of these interruptions to an minimum.

.2 Notify the Consultant, Owner and utility companies of intended interruption of services, obtain requisite permission.

.3 Where unknown services are encountered, immediately advise Consultant, confirm findings in writing and await instructions.

8. Power and Lighting

.1 Provide for all temporary power and lighting for use of trades as required to perform the work except as otherwise permitted.

.2 Pay for all permits and/or installation costs and make necessary arrangements.

.3 Electrical power and lighting systems installed under this Contract may be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used over a period of 3 months.

9. Heating and Ventilating

.1 Provide and pay for temporary ventilation required during construction, including costs of installation, fuel, operating,

maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by Architect.

.2 Provide and pay for temporary heat required to ensure ground below footings construction is not and will not become frozen and to ensure ground is and continues unfrozen under interior concrete slabs.

.3 Furnish and install 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 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 minimum temperature of 10°C or higher where specified, as soon as finishing work is commenced and maintain until Substantial Performance.

.5 Ventilating:
.1 Prevent hazardous 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 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

.6 Maintain strict supervision of operation of temporary heating and ventilating equipment.
.1 Enforce conformance 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 Permanent heating systems may be used on the written approval of Owner, engineer, and Architect, and provided provisions relating to guarantee, operation, and maintenance

are satisfactory to the Owner and Architect.

.8 Activate permanent heating system under direction of Engineer to provide temporary heat after taking precautions to assure proper operation of system.

.9 Protect existing and new duct systems with filters at all times; replace as necessary. Finally, vacuum clean entire duct system in addition and renovated areas, and renew filters.

10.
Streets and Traffic

.1 Provide all necessary flagmen, detour signs, warning lights, signs and barricades, necessary to direct and protect pedestrian and vehicular traffic during the work.

.2 Remove mud and clay from vehicles leaving site. Provide dust controls on site.

.3 Provide dust control to meet municipal regulations.

11.
Access

.1 Provide and maintain adequate access to project site.

.2 Supplement municipal snow clearing operations as required to keep access and work areas and adjacent walkways free of snow and ice.

12.
Drainage

.1 Provide temporary drainage and pumping as necessary to keep excavations, project site and adjacent properties free from water at all times.

.2 Protect open excavations against flooding and damage due to surface run-off.

.3 Dispose of water in a manner not detrimental to public and private property, or any portion of work completed or under construction.

.4 Use Best Management Practices including flocculation tanks, settling basins, or other treatment facilities as required to remove sediments, suspended solids, pollutants, or other materials which would degrade or impair water quality before discharging to storm sewers, water courses or drainage areas. Monitor regularly to ensure effectiveness at methods and compliance with Provincial/Federal Legislation pertaining

to water quality and habitat.

13. Shutdown

.1 Should work be stopped for any cause, provide protection for work, and all necessary cold weather heating during the work stoppage.

14. Pollution Control

.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.2 use methods and/or additional operators required to conform with local bylaws including those governing noise, dust, debris, and lights.

15. Roofing Protection

.1 Provide and maintain protection from anything that may damage or be detrimental to the waterproofing qualities of the various membranes. Include protection from construction work such as falling objects, wheel and foot traffic, failure to remove debris, scaffolding, hoisting equipment.

.2 Minimum Protection: 6mm waferboard over 25mm Type 1 polystyrene over 6 mil polyethylene.

16. Protection of Off-Site and Public Property

.1 Protect surrounding private and public property from damage during performance of work.

.2 Be responsible for damage incurred.

17. Removal of Temporary Facilities

.1 Remove all temporary facilities from site when directed by Architect.

.2 Repair or replace items damaged by temporary facilities to Architect's approval.

18.
Security

.1 Ensure equipment material and construction on site are protected from theft and vandalism. Provide site security to ensure no delay in the completion of the work, and no additional costs are incurred by Owner as a result of such theft or vandalism.

.2 Owner will not accept responsibility for any construction equipment or materials that are stolen or vandalized.

.3 Be responsible for theft from areas under construction.

.4 Ensure security of existing building is not jeopardized by construction operations. Protect all openings in exterior walls under Contractor's control against unauthorized entry.

END OF SECTION

1.
Safety Regulations

.1 The Contractor shall comply with the latest edition and amending regulations of the following documents, and in the case of conflicts between documents, the more stringent rule shall apply:
.1 National Building Code, Part 8: Safety Measures at Construction and Demolition Sites.
.2 Occupational Health and Safety Act 1990 Regulation 213/91 for Construction Projects.
.3 The Workplace Safety & Insurance Act 1997, and regulations as amended.
.4 Ontario Building Code 2006 Regulation 350/06 as amended.
.5 Ontario Fire Prevention & Protection Act 1997 and Ontario Fire Code Regulation 213/07.
.6 Ontario Environmental Protection Act, and Regulations as revised.
.7 Workplace Safety and Insurance Board First Aid Regulations.

2.
Temporary Stairs,
Hoists, Scaffold, Etc.

.1 Furnish and maintain all equipment such as stairs, ladders, ramps scaffolds, hoists, runways, derricks, chutes, elevators, etc., as required for proper execution of work.

.2 Construct and maintain scaffolding in rigid, secure and safe manner. Erect scaffolding independent of walls. Remove promptly when no longer required.

.3 Where such structures are of a complicated nature, employ the services of a Registered Professional Engineer to design such scaffolding, framework, or other temporary supports.

.4 Provide all necessary temporary barricades, fencing, guardrails, night lights, and barriers as necessary for the work.

3.
Safety Equipment

.1 Enforce use of CSA approved hard hats and safety boots for all entering or working on construction site. Refuse admission to those refusing to conform to this regulation.

.2 Provide and maintain adequate lighting where workmen or public may be subject to hazards and in all working areas.

.3 Comply with the requirements of the Federal and Ontario Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, and regarding labelling and the provision of material safety data sheets.

.1 Establish and maintain a manual for WHMIS. Include all WHMIS data sheets as required above. Turn over the complete manual to Consultant at completion of the work.

.2 WHMIS manual to include, but not be limited to all:

- adhesives
- solvents
- sealants
- resilient flooring
- paint, varnish, other coatings
- membrane waterproofing and air barriers
- special coatings, sealers, waxes
- solder, brazing and welding and other metal filler
- pressure treated wood and surface treatment of cuts
- other products where particles or vapours may become air borne after installation.

.4 In addition to the requirements of the Occupational Health and Safety Act, and Regulations for Construction Projects, provide temporary safeguards and protection against:

.1 Accident or injury to any workmen or other persons on the site, adjacent work and property, roads and walks.

.2 Damage to any part of the work and to any adjoining or adjacent structure, properties, pavements, walks, services, and other similar items by frost, weather, overloading, and any other cause resulting from the execution of the work.

.5 Make good with material identical with existing and adjoining surfaces any damage resulting from the execution of the work to any part of the work or any buildings, pavements, landscaping, poles, hydrants, services, etc., on or surrounding the site.

.6 Provide all necessary fall protection equipment and facilities required for the Consultant and his agents to review construction.

END OF SECTION

1.
Codes and Standards

.1 Conform to or exceed the minimum requirements of the National Building Code, Ontario Building Code Act, CMHC Residential Standards, Ministry of Housing Guide for Family Housing, and all Provincial and Municipal By-Laws and regulations affecting the work and working conditions. Latest editions and revisions and most conservative provisions, in the opinion of the Architect, apply.

.2 Part 9 of the Ontario Building Code shall serve as a minimum quality of work and materials.

.3 All materials or assembly of materials or manufactured items or tests of these shall conform to applicable requirements of the Canadian Standards Association (CSA) standards, the Canadian Government Specifications Board (CGSB) specifications, Underwriters Laboratories of Canada (ULC), Ontario Provincial Standards (OPS) specifications and drawings, or in the absence of these, the standards of the American Society for Testing Materials (ASTM).

.4 Where Contract Documents exceed these minimum code standards, specified standards, and referenced documents, perform the work in accordance with the additional requirements of the Contract Documents.

2.
Acceptable Materials and Products

.1 Means that item named and specified by catalogue name or number forms parts of specification and sets standard regarding performance, quality of material and workmanship, and when used in conjunction with a referenced standard, shall be deemed to supplement the standard.

.2 Equipment and products shall be one of the named suppliers.

3.
V.O.C.'s

.1 Adhesives cleaning agents, shall whenever possible, and consistent with performance requirements, be V.O.C. free or of low V.O.C. content.

4.
Asbestos

.1 Products shall be asbestos free.

5. Uniformity of Source

.1 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.2 Like products visible in the finished work shall be identical in appearance, colour, texture, sheen, configuration, arrangement and other characteristic affecting uniformity of appearance in the work.

6. Trade Names

.1 Wherever an item or class of material is specified exclusively by trade names or by names of the maker by catalogue reference, only such items shall be used, unless Architect's approval for a substitution is secured in writing during tender period.

.2 Should the Contractor desire to substitute another material for one or more specified by name, he shall apply in writing for such permission and state the credit or extra involved by the use of such material. He shall also provide data or samples for the Architect's consideration. No such material shall be used unless approved in writing by the Architect. In no case will the substitution of a product manufactured outside Canada for a Canadian-made product be considered.

7. Manufacturer's Directions

.1 All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as recommended by the manufacturer.

.2 Do not rely on labels or enclosures provided with products. Obtain written instructions from manufacturers.

.3 Notify Architect in writing of any conflict between these specifications and manufacturer's instructions. Architect will designate which document is to be followed.

8. Workmanship

.1 Execute work in accordance with the best standard practice utilizing mechanics skilled in their trades. Adequately brace and anchor work with proper provision for expansion shrinkage. Erect work true to lines, levels, dimensions,

square and plumb. Finish surfaces to be without perceptible sag, warp or surface defects and suitable for the purpose intended. Work shall conform to site conditions and measurements.

9. Patching

.1 In patching and making good, and in extending existing construction match in colour and texture all finishes visible within one area and all items of a similar nature to the full satisfaction of the Architect.

10. Handling

.1 Deliver, store and handle all material and products in a manner to prevent damage and deterioration. Ensure they are not exposed to an environment which would increase their moisture content beyond that specified.

.2 Package materials and products to protect them from damage or adulteration. Packaging shall be secure and retained unopened and with labels intact until use. Label packages with manufacturer's name, and to describe contents, quantity, location in building if applicable, and other information as may be specified.

.3 Handle equipment in accordance with manufacturer's and supplier's recommendations.

.4 Repair or replace damaged material as directed by Architect.

11. Protection

.1 Protect all work against damage until takeover by the Owner. Remove and replace, at own expense, any damaged work that cannot be repaired or restored to the Architect's satisfaction.

.2 Provide protection against spread of dust and dirt beyond work areas.

.3 Take particular care of all finished work as construction progresses and cover it with the necessary protective materials. Inspect all surfaces, wash and clean as directed upon removal of protective coverings.

.4 Note all buried services and take care not to damage them.

12.
Confining of Operations

.1 All materials and equipment shall be confined so as to prove no hazard to those frequenting the site. It is the responsibility of each trade to ensure that all materials, equipment, plant, tools, etc., that have not been incorporated into the construction are safely stored.

13.
Local Industry

.1 Obtain specified construction materials and equipment from suppliers in the same locality as the project in-so-far as possible.

14.
Fastenings

.1 Supply all fastenings, anchors, supports and accessories required for fabrication and erection of the Work.

.2 Where exposed use metal fastenings and accessories, etc., of same texture, colour and finish as base metal on which they occur.

.3 Use metal fastenings of same material as the metal component they are anchoring and of metal which will not set up an electrolytic action which would cause damage to the fastening or metal component under moist conditions. Use isolating material to permanently prevent the occurrence of electrolysis due to materials being fastened. In general, use non-corrosive or hot dip galvanized steel anchors for exterior anchors for windows, sheet metal roofing and anchors occurring on or in exterior walls or slabs.

.4 Use fastenings of such type and size and install in such a manner to provide positive permanent anchorage of the unit to be anchored in position. Install anchors at required spacing to provide required load bearing or shear capacity.

.5 Keep exposed fastenings to a minimum, evenly spaced and neatly laid out.

.6 Supply adequate instructions and/or templates, and if necessary, supervise installation where fastenings or accessories are required to be built into work performed by other subcontractors or suppliers.

.7 Fastenings shall be of a permanent type. Do not use wood plugs.

.8 Do not use fastenings which cause spalling or cracking of material to which anchorage is being made.

.9 Do not use powder activated fastenings on any portion of the work except in conformance with Occupational Health and Safety Act, and Regulations for Construction Projects.

.10 Protect all metals from other materials which may cause corrosion or deterioration - example, concrete on aluminum.

.11 Coordinate work with other trades. Arrange and pay for installations of sleeves, inserts, anchors, etc. by appropriate trade.

15.
Expansion, Contraction
And Deflection

.1 Provide for expansion and contraction between and within building components, products and assemblies due to changes in temperature, humidity and other phenomena.

.2 Provide for movement between and within building components, product assemblies due to deflection, sway, twist, creep, column shortening, vibration and other phenomena.

.3 Prevent damage to building components, products and assemblies due to expansion, contraction and building movement.

.4 At tops of partitions and walls, provide for deflection and shrinkage of the structure as well as for lateral and earthquake restraint. Maintain sound, fire, air, moisture, and thermal integrity of wall or partition. Determine requirements from Consultant where additional information is required.

16.
Cleaning: General

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile wastes in covered metal containers, and remove from premises daily.

.3 Prevent accumulation of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances.

.5 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

17. Cleaning During Construction

.1 Maintain project grounds and public properties free from accumulations of waste materials and rubbish.

.2 Provide on-site dump containers for collection of waste materials, and rubbish.

.3 Remove waste materials and rubbish from work on a daily basis and remove from site on a regular basis.

.4 Vacuum clean interior of building areas of this contract's dirt when ready to receive finishes and continue vacuum cleaning at least daily until building is ready for substantial completion or occupancy. Sweep floors and pavements clean on a daily basis.

.5 Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

18. Final Cleaning

.1 In preparation for substantial completion or occupancy, conduct inspection of sight-exposed interior and exterior surfaces.

.2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from sight exposed interior and exterior finished surfaces including glass and other polished surfaces.

.3 Clean lighting reflectors, lenses, and other lighting surfaces.

.4 Clean and polish all glass, mirrors, hardware, tile, chrome, aluminum, stainless steel, plastic laminate and plumbing, mechanical and electrical fixtures and equipment.

.5 Broom clean paved surfaces; rake clean other surfaces of grounds.

.6 Remove debris and surplus materials from roof areas and accessible concealed spaces.

.7 Replace heating, ventilating and air conditioning filters, clean ductwork and clean coils.

.8 Remove snow and ice from access to building including exits and fire lanes.

END OF SECTION

1.
Take-Over Procedure

.1 Follow procedures called for in "OAA/OGCA Document 100, dated December 12, 2007", “Recommended Procedures Concerning Substantial Performance of Construction Contracts and Completion Take-Over of Projects” and OAA/OCGA “ A Guide To Project Closeout Procedures” dated November 2010, except as otherwise required.

.2 Refer also to GC 5 Payment and relevant Supplementary Conditions.

.3 Costs for additional or unnecessary inspections occasioned by contractor's unjustified request for same will be deducted from amounts owing under the contract.

2.
Occupancy

.1 Owner reserves the right to occupy and use portions of work whether partially or entirely completed, or whether completed on schedule or not.

.2 Partial occupancy shall not imply acceptance of work in whole or in part, nor shall it imply acknowledgement that the terms of Agreement are fulfilled.

3.
System Demonstration

.1 Prior to Substantial Performance:
.1 Demonstrate operation of each system to Owner and Consultant.
.2 Instruct personnel in operation, adjustment and maintenance of equipment and systems, using provided operation and maintenance date as basis for instruction.

4.
Warranties

.1 Refer to Section 01 78 36 for details about extended warranties.

5.
Submittals

.1 Refer to Section 01 30 00 for submissions required at project completion.

6.
Final Cleaning

.1 Refer to Section 01 60 00.

END OF SECTION

1. Submittals

.1 Provide extended warranties called for in specifications.

.2 Submit warranty through Architect immediately after issuance of Certificate of Substantial Performance, to facilitate release of holdback monies.

.3 Where noted, submit as per "Sample Form of Extended Warranty" below. Contractor and Trade Contractor shall both sign and seal the Warranty.

.4 Refer to individual sections of the specifications for specific requirements of the warranties.

.5 Refer to GC 12.3: Warranty and Relevant Supplementary Conditions for general requirements.

.6 If validity of extended guarantee is related to proper maintenance and servicing of equipment, etc., full details must be provided in maintenance manuals.

SAMPLE FORM OF EXTENDED WARRANTY

TO DanPat Limited., operating as Surgenor Truck Centre. DATE _____

RE Surgenor Truck Centre. 1571 Liverpool Court., Ottawa, Ontario. K1B 4L1.

EXTENDED WARRANTY

FOR *(Name of Trade and Specification Sections or brief identification of work covered)*

WORK COVERED *(Clear description of work covered including specific requirements noted in individual specification sections)*

WARRANTY:

1. We agree to be responsible for the proper performance of the work only to the extent that the design and specifications permit such performance.

2. Subject to para. 1, We agree to correct promptly at our own expense, defects or deficiencies in the work which appear prior to and during the period of _____ years from the date of Substantial Performance of the Work, provided prompt written notice of observed defects and deficiencies is given.

3. We agree to correct or pay for damage resulting from defects or deficiencies referred to in para. 2.

4. We agree that the Owner may carry out detailed and exhaustive inspection of our work prior to expiry of this warranty.

5. Nothing in the above intends or implies that this warranty shall apply to work which has been abused or neglected.

_____	_____
(Name and Address of General Contractor)	(Name and Address of Trade Contractor)
(Signature & Corporate Seal)	(Signature & Corporate Seal)

PART 1 - GENERAL

1.1 Related Work

.1 Recycling — Section 01 00 00

.2 Electrical Demolition — Division 26

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 References

.1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.

1.4 Submittals

.1 Where required by authorities having jurisdiction, and as called for by structural drawings, submit for review, prior to proceeding, drawings, diagrams or details showing sequence of disassembly work or supporting structures.

.2 Drawings for shoring, underpinning and other structural elements shall bear stamp of qualified professional engineer registered in Province of Ontario.

1.5 Methods

.1 Prior to commencing demolition, submit for review proposed procedures and list of equipment to be used. Use methods which will minimize vibration.

.2 Schedule work which would disturb users' operations, outside users normal work hours.

1.6 Waste Management and Disposal

.1 Separate waste materials for recycling in accordance with Section 01 00 00.

1.7 Existing Drawings

.1 Copies of some of the previous permit drawings are available at the Architect's office for viewing.

PART 2 - PRODUCTS

.1 Not applicable.

PART 3 - EXECUTION

3.1
Protection

.1 Prevent movement, settlement or damage of adjacent structures, services, and parts of existing building to remain. Provide bracing, shoring and underpinning required. Make good damage and be liable for injury caused by demolition.

.2 Take precautions to support structures and, if safety of building being demolished or adjacent structures or services appears to be endangered, cease operations and notify Consultant.

3.2
Work

.1 Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.2 Carefully remove materials and equipment designated for reuse, store, protect and leave ready for reinstallation by qualified trades persons.

.3 Perform selective demolish of architectural, structural and mechanical and electrical systems as indicated on the drawings..

3.3
Preparation

.1 Co-ordinate any particular demolition or dismantling operations covered under mechanical and electrical or other sections of this specification. Determine and arrange with appropriate and competent forces or trades their respective work.

.2 Do not disrupt active or energized utilities designated or required to remain undisturbed.

.3 Notify Consultant before disrupting building services in accordance with Section 01 50 00.

3.4
Demolition

.1 Remove items as authorized for removal on the drawings, as required to install new materials, finishes, and equipment, indicated, and where existing items are no longer required for

functioning of the completed work. Consult all drawings and examine site to determine extent of work.

.2 Remove existing plant equipment and fitments where called for to be replaced by new or no longer required for the functioning of the finished work.

.3 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. At all times, protect interiors of parts of building not to be demolished from exterior elements.

.4 Demolish to minimize dusting. Keep dusty materials wetted.

.5 Demolish masonry and concrete walls in small sections. Carefully remove and lower structural framing and other heavy or large objects.

.6 Remove contaminated, hazardous, or designated materials from site and dispose of in safe manner, to minimize danger at site or during disposal; in accordance with governing regulations.

.7 Remove all demolished materials from site except as otherwise noted.

.8 Remove from substrate, fasteners and adhesives used to attach material being demolished, except as otherwise approved.

.9 Do not sell or burn materials on site.

3.5
Restoration

.1 Upon completion of work remove debris, trim surfaces and leave work site clean.

.2 Reinstate areas and existing works outside areas of demolition to conditions satisfactory to Owner and to authorities having jurisdiction.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Concrete Reinforcement Section 03 20 00

.2 Cast-in-Place Concrete Section 03 30 00

.3 Concrete Floor Finishes Section 03 35 00

1.2 Reference Standards

.1 Do concrete formwork in accordance with CAN/CSA-A23.1-14 and CSA Standard S269.3 (R2013), except where specified otherwise.

PART 2 - PRODUCTS

2.1 Materials

.1 Formwork materials:

.1 For concrete not exposed to view use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86-09, CSA O437 Series and CSA-O153-09.

.2 For concrete exposed to view, use new formply and formwork materials to CAN/CSA-A23.1-14.

.2 Form ties:

.1 For concrete not exposed to view, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.

.2 For concrete exposed to view and where ties are unavoidable, use snap ties complete with plastic cones and light gray concrete plugs.

.3 Form release agent: chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing concrete from sticking to forms.

PART 3 - EXECUTION

3.1 Erection

.1 Verify lines, levels and column centres before proceeding with formwork and ensure dimensions agree with drawings.

.2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-14.

.3 Obtain Engineer's permission before framing openings not indicated in concrete slabs, walls, piers and footings.

.4 Align form joints and make watertight. Keep form joints to minimum. Locate horizontal form joints for exposed walls to approval of Architect.

.5 Form chases, slots, openings, drips, recesses expansion and control joints as indicated.

.6 Clean formwork in accordance with CAN/CSA-A23.1-14, before placing concrete.

.7 Leave formwork in place for following minimum periods of time after placing concrete.
- .1 Two days for foundation walls.
- .2 24 hours for footings and foundation elements, not exposed to view.

After form removal cover and protect concrete for the remainder of the initial curing period. Use insulated tarps for cold weather operation.

.8 Re-use of formwork subject to requirements of CAN/CSA-A23.1-14.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Concrete Formwork Section 03 10 00

.2 Cast-in-Place Concrete Section 03 30 00

1.2 References

.1 ANSI/ACI 315-80, Details of Concrete Reinforcement.

.2 ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.

.3 Reinforcing steel manual of standard practice - Reinforcing Steel Institute of Ontario.

.4 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.

.5 CSA-A23.18-09, Design of Concrete Structures for Buildings.

.6 CSA G30.18-09, Cold Drawn Steel Wire for Concrete Reinforcement.

.7 CSA G30.18-09, Welded Steel Wire Fabric for Concrete Reinforcement.

.8 CSA G30.12-M1977, Billett-Steel Bars for Concrete Reinforcement.

.9 CSA G30.16-M1977, Weldable Low Alloy Steel Deformed Bars for Concrete Reinforcement.

1.3 Source Quality Control

.1 Upon request, provide Engineer with certificate copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Engineer of proposed source of material to be supplied.

1.4 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Shop drawings consist of bar bending details, lists and placing drawings.

.3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and mechanical splices, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacing and location of chairs, spacers and hangers. Do drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Ontario.

.4 Design and detail lap lengths and bar development lengths to CSA-A23.3-04, unless otherwise indicated.

.5 Approval applies to general arrangement and does not relieve responsibility for making this work complete, accurate and conforming to drawings and specifications.

1.5 Substitutes

.1 Substitution of different size bars permitted only upon written approval of Engineer.

PART 2 - PRODUCTS

2.1 Materials

.1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.12-M1977.

.2 Welded steel wire fabric: to CSA G30.15-M1983. Provide in flat sheets only.

.3 Chairs, bolsters, bar supports, spacers: to CSA A23.1-14.

.4 Mechanical splices: subject to approval of Engineer.

2.2 Fabrication

.1 Fabricate reinforcing in accordance with CSA-A23.1-14 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

.2 Obtain Engineer's approval for locations of reinforcement splices other than shown on placing drawings.

.3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

PART 3 - EXECUTION

3.1 Field Bending

.1 Do not field bend reinforcement except where indicated or authorized by Engineer.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on approved placing drawings and in accordance with CSA-A23.1-14.

.2 Prior to placing concrete, obtain Engineer's approval of reinforcing steel and position.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Concrete Formwork Section 03 10 00

.2 Concrete Reinforcement Section 03 20 00

.3 Concrete Floor Finishes Section 03 35 00

.4 Vapour Barriers Section 07 26 00

1.2 Reference Standards

.1 Do cast in place concrete work in accordance with CSA-A23.1-14, and testing in accordance with CSA-A23.2-14 except where specified otherwise.

.2 CAN-A266.4-M78, Guidelines for use of admixtures in concrete.

PART 2 - PRODUCTS

2.1 Materials

.1 Portland cement: to CAN/CSA-A5

.2 Water: to CSA-A23.1-14.

.3 Aggregates: to CAN/CSA-A23.1-14. Coarse aggregates to be normal density.

.4 Air entraining admixture: to CAN3 A266.1 M78.

.5 Chemical admixtures: to CAN3 A266.2 M78. Engineer to approve accelerating or set retarding admixtures during cold weather placing.

.6 Non premixed dry pack grout: composition on non-metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into a ball by hand and capable of development compression strength of 50 MPa at 28 days.

.7 Curing Compound: To CSA-A23.1-14.

.8 Premoulded joint fillers:
.1 Bituminous impregnated fibreboard: to ASTM D1751 91.

2.2 Concrete Mixes

.1 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for exterior concrete and wash bay.
.1 Cement: use Type GU or GUb Portland cement.
.2 Minimum compressive strength at 28 days: 35 MPa.
.3 Class of exposure: C-1
.4 Nominal size of coarse aggregate: 20 mm.
.5 Slump at time and point of discharge: 75 mm.
.6 Air Content: 5 to 8%

.2 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for all perimeter foundation walls.
- .1 Cement: use Type GU or GUb Portland cement.
- .2 Minimum compressive strength at 28 days: 25 MPa.
- .3 Class of exposure: F-2
- .4 Nominal size of coarse aggregate: 20 mm.
- .5 Slump at time and point of discharge: 75 mm.
- .6 Air Content: 4 to 7%.

.3 Proportion normal density concrete in accordance with CSA-A23.1-14, to give the following properties for all other concrete.
- .1 Cement: use Type GU or GUb Portland cement.
- .2 Minimum compressive strength at 28 days: 25 MPa.
- .3 Nominal size of coarse aggregate: 20 mm.
- .4 Slump at time and point of discharge: 75 mm.

.4 Use of calcium chloride or admixtures containing calcium chloride, not permitted.

PART 3 - EXECUTION

3.1 Workmanship

.1 Obtain Engineer's approval before placing concrete. Provide 24 h notice prior to placing of concrete.

.2 Pumping of concrete is permitted only after approval of equipment and mix.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Prior to placing of concrete obtain Engineer's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.6 Do not place load upon new concrete until authorized by Engineer.

3.2 Inserts

.1 Set sleeves, ties, and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 mm X 100 mm not indicated on structural drawings must be approved by Engineer.

.2 No sleeves, ducts, pipes or other openings shall pass through piers, except where expressly detailed on structural drawings or approved by Engineer.

.3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Engineer before placing of concrete.

.4 Check locations and sizes of sleeves and openings shown on structural drawings with architectural, mechanical and electrical drawings.

.5 Anchor bolts:

.1 Place anchor bolts to templates under supervision of trade supplying anchors prior to placing concrete.

3.3 Placing Grout

.1 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

3.4 Finishing

.1 Finish concrete in accordance with CAN/CSA-A23.1-14.

.2 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

.3 Concrete exposed to public view to have a smooth-form finish unless specified otherwise.

3.5 Joint Fillers

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Engineer. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.2 Locate and form isolation joints as indicated. Install joint filler.

.3 Use 12 mm thick joint filler to separate slabs on grade from vertical surfaces and extend joint filler from bottom of slab to within 1/2 in. of finished slab surface unless indicated otherwise.

3.7 Field Quality Control

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Owner in accordance with CSA-A23.1-14.

.2 Costs of tests will be paid for as specified in Sections 01 40 00.

.3 Engineer will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.4 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

3.8 Sawcutting of Control Joints

.1 In slab-on-grade construction, perform and complete saw cutting of all control joints within 12 hours after concrete placement. Sawcutting shall begin as soon as concrete can support the workers and equipment.

.2 Configuration and extent of sawcut control joints shall be as shown on the drawings.

.3 Sawcutting to be performed using power driven abrasive or diamond blades. Depth of sawcuts shall be as indicated on drawings.

3.9 Defective Concrete Finish

.1 Remove and replace excessive honeycomb or embedded debris in concrete as directed by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work	.1	Concrete Reinforcement	Section 03 20 00
	.2	Cast-in-Place Concrete	Section 03 30 00
	.3	Sealants	Section 07 92 00

1.2 Reference Standards .1 Do concrete floor finishing work in accordance with CAN/CSA-A23.1-14 except where specified otherwise.

PART 2 - PRODUCTS

2.1 Materials .1 Concrete materials to Section 03 30 00 - Cast-in-Place Concrete; and reinforcement to Section 03 20 00 - Concrete Reinforcement.

.2 Absorptive mat or fabric for curing.

.3 Curing and sealing compound: to ASTM C309 Type 1 Class B, clear.

PART 3 - EXECUTION

3.1 Floor Finish .1 Floor slab surfaces shall be finished to Class A classification as defined in CAN/CSA-A23.1-14, Table 22.

.2 Do not sprinkle dry cement or dry cement and sand mixture over concrete surfaces.

.3 Saw cut crack-control joints to CSA-A23.1-14.

.4 Apply floor curing and sealing compounds to manufacturer's instructions. Cure to manufacturer's recommendations.

.5 Cure concrete in accordance with CAN/CSA-A23.1-14 except where specified otherwise.

.6 Provide any housekeeping pads for electrical and mechanical equipment.

.7 Slope floor to drain at 5mm/m. except as indicated otherwise. Floors to be level around walls.

.8 Provide non-slip light broom finish to exposed interior steps and landings. Provide non-slip medium broom finish to exposed exterior steps, ramps and landings.

.9 Interior ground floor slab on grade to be cured using an absorptive mat or fabric kept continuously wet for min. 4 days.

3.2 Protection .1 Protect concrete to be left exposed throughout the course of construction. Make good damaged areas to the approval of the Engineer.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1	Angle Lintels:	Division 05
.2	Setting Pressed Steel Frames:	Section 06 10 00
.3	Dampproof Flashing:	Section 07 11 20
.4	Thermal Insulation:	Section 07 21 00
.5	Joint Sealants:	Section 07 92 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Reference Standards

.1 Do masonry work to CAN3-A371-04 (R2014)except where specified otherwise.

.2 Do mortar and grout work to CSA A179-04 (R2014) except where specified otherwise.

.3 Do masonry reinforcing and tying to CSA A370-04 (R2014) and
CSA-S304.1-04unless specified otherwise.

1.4 Mock-Up

.1 Construct 2m x 1.5m panel of exterior masonry wall construction showing masonry colours, textures and patterns, use of reinforcement, ties, through wall flashing, weepholes, jointing, coursing, mortar, corners, sills and workmanship.

.2 If acceptable, mock-up may be incorporated into final wall construction.

1.5 Source Quality Control

.1 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements, in accordance with Section 01 30 00.

1.6
Samples

.1 Submit samples in accordance with Section 01 30 00:
.1 One of each type of horizontal reinforcement, ties, fasteners and accessories.
.2 As required for testing purposes.
.3 Architectural blocks indicating full range and proportion of colours, texture, pattern.

1.7
Testing

.1 Inspection and testing will be carried out by Testing Laboratory designated by Consultant.

.2 Costs will be paid as specified in Section 01 21 00, except as specified in Section 01 45 00.

1.8
Delivery and Storage

.1 Deliver materials to site in dry condition.

.2 Keep materials dry until use, except where wetting of bricks is specified.

.3 Store materials under waterproof cover on platforms held off ground and in other ways that prevent water from entering the materials.

1.9
Cold Weather Requirements

.1 Supplement clause 5.15.2 of CAN3-A371 with the following requirements:
.1 Maintain temperature of water between 5 °C and 50 °C until used.
.2 Do not use calcium chloride.
.3 Lay masonry on unfrozen surfaces free from snow, ice and frost.

.2 Maintain materials and surrounding air temperature at min. 10°C prior to, during and for 48h after completion of masonry work.

1.10
Hot Weather Requirements

.1 Protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.

.2 Pre-dampen manufactured stone units under extremely hot weather conditions. Pre-dampen to manufacturer's instructions.

1.11
Protection

.1 Keep masonry dry using waterproof non-staining coverings. Drape over wall and extend down both sides sufficient to protect walls from wind driven rain until masonry work is completed and protected by flashings or other permanent construction.

.2 Protect adjacent facework from droppings, marking or damage due to masonry work.

.3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

1.12
Maintenance Data

.1 Submit maintenance data for brick for incorporation into maintenance manual specified in Section 01 30 00.

.2 Include specific cleaning instructions for graffiti, paint, dye, asphalt, oil, grease, foods and other common substances.

PART 2 - PRODUCTS

2.1
Materials

.1 Concrete block: To CSA A165 Series-04. Size: metric modular. Block to be manufactured by a O.C.B.A. member and conform to the Quality Assurance Program.

.1 Classification: H/15/A/M (net area). Provide gross area strength per structural drawings. Use lightweight (type H/7.5/B/M) blocks of $L_2$20S concrete or higher percent solid block as required to achieve fire-rating indicated.

.2 Special Shapes: Provide bullnosed units for exposed corners. Provide purpose made units for lintels, columns, and bond beams. Use solid, or capping concrete block units at exposed tops of window sills and partial height walls.

.2 Architectural Block:

.1 Architectural Concrete Block: Classification; H/20/A/0,

size; metric modular size, 90 x 190 x 390mm, incorporating water repellant admixture. Provide finished end blocks where ends exposed. Acceptable Products: Permacon ”Noble Series”, colour : Parchment Beige, buffed finish.

2.2
Reinforcement

.1 Reinforcing bars: CSA G30.18-M92, Grade 400.

.2 Horizontal reinforcement: Galvanized, truss type, 50mm narrower than wall. Side rods min. 3.7mm dia., use heavier rods where called for.

.3 Cavity Wall Veneer Reinforcement Ties:
.1 Masonry backed: Blok-Lok BL-37 with 4.8mm dia. Blok-Lok, “2000" series box ties, or Fero Slotted Block Tie, Type 1 with 4.8mm dia. Vee tie or Blok-Lok BL507 with 4.8mm dia. triangular tie.

.4 Steel Stud backed: 1.9mm (14 ga.), Z275 galvanized steel, with 4.8mm dia. wire triangular tie; to match Bailey (WAT) #10-18.

.5 Fasteners:
.1 Fasteners to steel studs: Sheet metal screws with self-drilling tip, round or pan head, min. 10mm longer than material to be fastened. Min. 4.8mm diameter (#12).
.1 Corrosion resistance: Acceptable Coatings include: “Climaseal”, “Climacoat”, “Sentri”, or “Spex” coated or acceptabe equal.
.2 Zinc plated, yellow zinc plated and phosphate coated fasteners not acceptable.

.6 Insulation Fasteners: Blok-Lok “Wedge-Lok” or Fero “Insulation Support”.

.7 Corrugated ties: Min. 1.6mm thick x 25mm x length to suit, steel, hot dip galvanized. Use only to tie new blockwork to existing blockwork.

.8 Corrosion protection: To CSA-A370 for metal ties and horizontal reinforcement in exterior walls supplemented as follows:
.1 Horizontal reinforcement in above areas: Hot dip galvanized with min. 0.46kg zinc/m2.
.2 Horizontal reinforcement in inner wythe of exterior walls; electro galvanized with min. 0.20kg zinc/m². (“Mill” galvanized insufficient.)

2.3
Mortar Types

.1 To CSA A179. Use only clean washed sand, clean potable water, and low-alkali cement (i.e. 0.6% alkali or less by weight).
.1 Blockwork: Type "S" based on property specifications.
.2 Grout: 15 MPa pea gravel concrete conforming to Section 03 30 00 with sufficient water to produce pouring consistency without separation of ingredients.
.3 Type N Mortar: St. Lawrence Cement's Mason's Choice High Bond, Type N.

.2 Admixtures: Do not incorporate admixtures without prior written approval from Consultant.

2.4
Material Source

.1 Use same brands of materials and source of aggregate for entire project.

2.5
Exposed Masonry Faces

.1 Notwithstanding visual inspection requirements of CSA standards, masonry units shall be free of surface indentations, surface cracks due to manufacture, or chipping. Cull units so delivered from use for exposed purposes.

PART 3 - EXECUTION

3.1
Workmanship

.1 Build masonry work true-to-line, plumb, and level, with vertical joints in alignment.

.2 Assume complete responsibility for dimensions, plumbs, and levels of this work and constantly check same with graduated rod.

.3 Layout coursing and bond to achieve correct coursing heights, continuity of bond above and below openings, with minimum of cutting.

.4 Remove excess mortar daily and mortar contamination of adjacent work immediately.

.5 Lay masonry in running stretcher bond except as otherwise noted or indicated.

.6 Remove chipped, cracked and otherwise damaged units in exposed masonry and replace with undamaged units.

.7 Carry up walls in a uniform manner, raise no one portion more than 1.2m above another at any time. Build no more than 1.5m of wall measured vertically in any one day.

.8 Extend non-bearing partitions to underside of floor or roof above except as otherwise specified.

.9 Clean sand, dirt and other contaminants from bonding surfaces of masonry units before laying.

.10 Align masonry units within 15 seconds of placement.

.11 Lay hollow masonry units with face shell and head joints fully mortared on both faces.

.12 Except for head joints left open for weep holes and ventilation, lay solid masonry units with full head and bed joints.

3.2
Tolerances

.1 Tolerances in notes to Clause 5.3 of CAN3-A371 apply.

3.3
Jointing

.1 Allow joints to set just enough to remove excess water then tool with round jointer to provide smooth, compressed, uniformly concave joints. (except as indicated or noted). Tool joints at consistent mortar hardness.

.2 Rake out joints to accept metal flashing and wedging where indicated.

.3 Where joints are concealed in walls and where walls are to receive drywall, ceramic tile, EIFS, or other applied material, (except paint and thin coatings) strike joints flush.

.4 Make exposed joints in lintels and bond beams to match adjacent walls.

3.4
Cutting Masonry

.1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in items. Make cuts straight, clean, and free from uneven edges. Use approved type power saw to cut masonry units exposed in finished work.

3.5
Building-In

.1 Build in items required to be built into masonry including door and window frames, anchors, nailing strips and other items.

.2 Brace metal frames to prevent distortion. Fill frame voids with mortar or grout as wall is erected.

.3 Install loose steel lintels. Centre over opening width.

.4 Build in sleeves, frames and boxes for passage of pipes, ducts and conduits.

.5 Prevent displacement of built-in items during construction.

.6 Do not cover any pipe, conduit chases or enclosures until that work has been reviewed by the Consultant.

.7 Ensure door bumpers are in place prior to grouting door frames.

3.6
Provision for Movement

.1 Leave space below structural shelf angles; 12mm or as indicated.

.2 Leave space at top of non-load bearing elements. Do not use wedges.
.1 Under steel beams leave 20mm space.
.2 Under steel joists and deck leave 25mm space, except under steel joists exceeding 8m length, leave space equal to L/360 plus 3mm.

3.7
Horizontal Reinforcing

.1 Install continuous horizontal reinforcing in concrete block walls at max. 400mm o.c. (or 200mm where indicated).

.2 Bond walls of two or more wythes using adjustable horizontal reinforcement at max. 400mm vertically and 600mm o.c.

horizontally, except as otherwise noted.

.3 Additionally place reinforcing in the first and second joints above and below openings. Extend 600mm beyond each side of opening.

.4 Reinforce masonry where thickness is reduced by a column or chase with a length of horizontal reinforcing in the joint of every block course and extending 1.2m beyond each end of column or chase.

.5 Utilize "L" and "T" shaped joint reinforcement at corners and abutting partitions.

.6 Tie intersecting non-bearing walls together with reinforcing in every second course.

3.8
Earthquake Reinforcing

.1 Reinforce load bearing masonry in accordance with Ontario Building Code and as indicated.

.2 Reinforce following masonry elements in accordance with CAN3-A371 and as indicated, supplemented as follows:
.1 Load bearing and lateral load-resisting masonry, and
.2 Masonry used as exterior cladding, and
.3 Masonry partitions exceeding 200kg/m2 or 3m in height.

.3 Provide lateral support and anchorage in accordance with CAN3-A371 and as indicated and specified.
.1 Locate cavity walls veneer reinforcement at max. 400mm o.c. one way and max. 600mm o.c. the other way.
.2 Additionally reinforce brick/architectural block to masonry/concrete backup:
- at max. 300 mm below top of walls and sills.
- at max. 300 mm below top of walls below horizontal control joints.
- at max. 400mm above bearing, including angle lintels
- adjacent to jambs of openings at same centres as other ties but max. 600mm oc.

.3 Additionally reinforce brick block to steel stud framing:
- at max.300 mm oc. at jambs of windows, doors, and other openings.
- at max. 200 mm below top of walls and sills.
- at max. 200 mm below top of walls below horizontal control joints.

- at max. 333 mm above bearing; including angle lintels.

.4 Set dowels in foundations and floor slabs at cores of block to be reinforced.

.5 Install vertical rod reinforcing in cores, sized and spaced as shown on drawings.

.6 Lap reinforcing min. 36 bar diameters at splices.

.7 Anchor reinforcing to floor or foundation and to structure above.

.8 Anchor masonry to structural beams, columns, and walls at max. 800mm oc. vertically and max. 1.2m oc. horizontally.

.9 Embed bolts and anchors solidly in mortar or grout to develop maximum resistance to design forces.

.10 Consult drawings for additional reinforcing.

3.9
Filling Cores

.1 Place and grout reinforcing in accordance with CAN3-A371 and as indicated.

.2 Grout all block cores which are reinforced.

.3 Grout parapet walls solid down to top of structural deck.

.4 Grout block cores solid for two courses below bearing points of structural and stair members, and as indicated on drawings.

.5 Grout and reinforce block cores where required to anchor work of other trades.

.6 Install building paper and wire mesh in the course below cores to be filled. Keep 25mm back from face of units.

3.10
Openings

.1 At all openings in walls form, brace, and set lintel blocks for concrete block lintels. Provide min. 200mm bearing. Install reinforcing and concrete as per structural drawings (or if not shown, use two 15M bars for lintels up to 1.2m wide and use

400mm deep lintel with
four -15M bars for lintels up to 2.4m wide.)

.2 At all openings in block masonry walls exceeding 600mm in depth, fill core at each side and for 600mm past the top and bottom of opening with grout and reinforce with reinforcing as specified for wall. Similarly treat openings over 1.2m in depth but extend grout and reinforcement the full storey height.

.3 Place and grout reinforcement for lintels and bond beams in accordance with CSA-S304.1, CSA-A371 and CSA-A179.

3.11
Through-Wall Flashings

.1 Provide as per Section 07 11 20.

3.12
Cavity-Walls

.1 Provide weep holes by leaving out vertical mortar joints and inserting grey plastic weep hole louvre inserts. Provide just above shelf angles, beams, dampproof courses and flashings and at bottom of cavities. Locate at max. 600mm oc.

.2 Keep cavity free of mortar and mortar droppings. Backslope mortar beds at cavities just sufficient to minimize mortar projection into cavity.

3.13
Brickwork

.1 Lay brick in running stretcher bond and as shown. Coursing to be 200mm for three bricks and three joints.

.2 Mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.3 Except in wet weather, dampen clay brick having an initial rate of absorption exceeding 1g/min/1000mm2 wet to uniform degree of saturation 3 to 24 hours before laying and do not lay until surface is dry. During cold weather use water heated to minimum 20 degrees for masonry units which are above 0 degrees celsius and to between 55 and 70 degrees for masonry units which are below 0 degrees celsius. Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

3.14

Control Joints

.1 Provide continuous control joints as indicated.

.2 Provide continuous vertical shrinkage control joints in concrete block partitions and walls at locations indicated or at max. 15m. oc. in approved locations. Rake out 8mm, ready for caulking. Use "Chicago" joint.

.3 Provide continuous vertical expansion control joints in brickwork at locations indicated and at max. 15m oc. and max. 5.7m from wall corners, in approved locations.

.4 Keep expansion control joints free of mortar.

.5 Stop masonry reinforcing 25mm from each side of control joints.

.6 Bond beam reinforcing to be continuous across control joints. Provide half block and vertical joint across bond beam.

3.16
Cleaning Concrete Block

.1 Allow mortar droppings on unglazed concrete masonry to partially dry, then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing.

.2 Clean Architectural Block in accordance with manufacturer’s recommendation.

.3 Do not use acid, steel wool, wire brushes, or abrasives.

.4 Clean architectural block in accordance with manufacture’s recommendations.

3.17
Cavity Cut-offs

.1 Block corners of cavity wall air spaces using expanding insulation in accordance with Section 07 21 00.

END OF SECTION

PART 1 GENERAL

1.1 Related Work	.1	Cast-in-Place Concrete	Section 03 30 00
	.2	Painting	Section 09 91 00

1.2 Reference Standards

.1 Do structural steel work in accordance with CAN/CSA-S16-09 and CAN3-S136-07 except where specified otherwise.

.2 Do welding in accordance with CSA W59-13, by companies certified by and welders qualified in accordance with CSA W47.1-09, except where specified otherwise.

1.3 Source Quality Control

.1 Prior to commencing of work, if required by Engineer, submit 3 certified copies of mill reports covering chemical and physical properties of steel used in this work.

1.4 Design Of Details

.1 Design details and connections in accordance with requirements of and Connections CAN/CSA-S16-09 and CAN3-S136-07.

.2 For all connections, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in the Province of Ontario or submit shop drawings stamped and signed by a qualified professional engineer licensed in the Province of Ontario with the proviso "for connections only".

1.5 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Indicate shop and erection details including cuts, copes, connections, holes, bolts and welds. Indicate welds by welding symbols defined in CSA W59-13.

PART 2 - PRODUCTS

2.1 Materials

.1 Structural steel: to CAN3-G40.21-13 Grade as indicated on structural drawings.

.2 Anchor bolts: to CAN3-G40.21-13, Grade 300W.

.3 Bolts, nuts and washers: to ASTM A325M.

.4 Welding materials: to CSA W59-13.

.5 Shop paint primer: to CISC/CPMA standard 1-73a.

.6 Exterior shop paint primer: zinc rich to CGSB 1-GP-171M.

.7 Hot dip galvanizing: Galvanize steel, where indicated, to CSA G164-M92.

PART 3 - EXECUTION

3.1 Fabrication

.1 Fabricate structural steel, as indicated, in accordance with CAN/CSA-S16-09 and in accordance with approved shop drawings.

3.2 Shop Painting	.1	Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16-09.
	.2	Apply two coats of zinc rich primer to steel members exposed to weather, or within exterior cavities, except where noted to be galvanized. All surfaces of such members to be painted. Total coating thickness 0.75mm. Clean to commercial blast SP6 standard prior to coating.
	.3	Apply primer paint to exposed surfaces without sags or runs. Sand down and repaint areas not acceptable to the Architect.
3.3 Marking	.1	Mark materials in accordance with CAN3-G40.20-13 and CAN/CSA-G40.21-13. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
	.2	Match marking: shop mark for fit and match.
3.4 Erection	.1	Erect structural steel, as indicated and in accordance with CAN 3-S16-09 and in accordance with shop drawings.
	.2	Obtain written permission of Engineer prior to field cutting or altering of structural members not shown on shop drawings.
	.3	Clean mechanical brush and touch up primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
3.5 Field Quality Control	.1	Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Owner.
	.2	Costs of tests will be paid for as specified in Section 01 45 00 Quality Control.
3.6 Hot Dip Galvanizing	.1	Hot-dip galvanize all loose lintels including supports as well as guards, gates and and hand rails.
	.2	Provide a minimum zinc coating of 600 g/m2.
	.3	Repair areas damaged during construction

END OF SECTION

PART 1 - GENERAL

1.1 Related Work	.1	Structural Steel	Section 05 12 00
	.2	Steel Decking	Section 05 30 00
	.3	Painting	Section 09 91 00

1.2 Reference Standards

.1 Do work in accordance with CAN/CSA-S16-09, AN/CSA-S136-07, except where specified otherwise.

.2 Do welding in accordance with CSA W59-M1989 except where specified otherwise.

.3 Use qualified fabricators in accordance with CSA W47.1-1992 and "CISC Steel Joist Facts".

1.3 Design of Steel Joists and Bridging

.1 Design steel joists panel point welded connections and bridging to carry loads indicated on drawings in accordance with CAN/CSA-S16-09 CAN/CSA-S136-07

.2 Snow load deflections for roofs are not to exceed the lesser of L/360 or 25 mm.

1.4 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Each drawing submitted shall bear the signature and stamp of qualified professional engineer licensed in Province of Ontario.

.3 Indicate joist spacing, bridging lines, bearing and anchorage details, framed openings, accessories, schedule of materials, depth, camber and loadings.

PART 2 - PRODUCTS

2.1 Materials

.1 Structural steel: to CAN/CSA-G40.21-04 and CAN/CSA-S136-07

.2 Welding materials: to CSA W59 with CSA W59S1.

.3 Shop paint primer: to CISC/CPMA standard 1.73a.

2.2 Fabrication

.1 Fabricate steel joists and accessories in accordance with CAN/CSA-S16-09 and CAN/CSA-S136-07and in accordance with reviewed shop drawings.

.2 Weld in accordance with CSA W59-M1989.

2.3 Shop Painting

.1 Clean, prepare surface and shop prime steel to CAN/CSA-S16-09.

PART 3 - EXECUTION

3.1 Erection

.1 Erect steel joists and bridging as indicated in accordance with CAN/CSA-S16-09 and CAN/CSA-S136-07and in accordance with shop drawings.

.2 Obtain written permission from Engineer prior to field cutting or altering joists or bridging.

.3 Clean and touch up shop primer to bolts, welds, burned or scratched surfaces at completion of erection.

3.2 Field Quality Control

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Owner.

.2 Costs of tests will be paid for as specified in Section 01 45 00 Quality Control.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Structural Steel Section 05 12 00

1.2 Reference Standards

.1 American Society for Testing and Materials International, (ASTM)

- .1 ASTM A653/A653M-08, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A792/A792M-08, Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

- .1 CSA C22.2 No.79-1978(R1999), Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
- .2 CAN/CSA-S16-09 Design of Steel Structures.
- .3 CSA-S136-07, Cold Formed Steel Structural Members.

.4 Canadian Sheet Steel Building Institute (CSSBI)

- .1 CSSBI 10M-96, Standard for Steel Roof Deck.

PART 2 - PRODUCTS

2.1 Materials

.1 Zinc (Z) coated steel sheet: to ASTM A653/A653M structural quality Grade A with Z275, coating, 0.91 to 1.21 mm base steel thickness.

.2 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness varies. Refer to plans. Metallic coating same as deck material.

.3 Primer: zinc rich, ready mix to CAN/CGSB-1.181.

2.2 Types Of Decking

.1 Deck: Refer to drawings.

.2 Roof deck: 0.91 mm minimum base steel thickness, 38mm deep profile, fluted, @152 o/c, non-cellular, overlapping side laps unless noted on drawing.

PART 3 - EXECUTION

3.1 General

.1 Structural steel work: in accordance with CAN/CSA-S136-07 and CSSBI 10M and CSSBI 12M.

3.2 Erection	.1	Erect metal decking as indicated to manufacturer's instructions
	.2	Immediately after decking is permanently secured in place touch-up galvanized surface with zinc rich primer where burned by welding.
	.3	Fastening requirements shall be as noted on structural drawings.
	.4	The decking shall be continuous over at least 3 spans with ends lapped 50mm minimum over supports.
3.3 Storage	.1	Decking shall be stored on wood supports above the grade and sloped so as to allow runoff along down flutes.
3.4 Accessories	.1	Provide all required closures, reinforcing sheet steel and flashing.
3.5 Field Quality Control	.1	Inspection, testing of material and workmanship will be carried out by testing laboratory.
	.2	Quality assurances shall be in conformance with Section 01 45 00.
	.3	Damaged decking shall be replaced at Consultants discretion.
3.6 Review of Construction	.1	Review of construction by the Consultant and inspection and testing by an independent inspection is to ascertain general conformity with design documents. The review does not relieve contractor from carrying out his own quality control and making the work accurate and in conformity with the drawings and specification.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Other Metal Studding, Drywall: Section 09 21 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
Design Criteria

.1 Base design on Limit States Design principles using factored loads and resistances.

.2 Loads and load factors shall be in accordance with the Building Code of Ontario. Min. unfactored wind load 1.0 kPa. Min. Category 2 internal wind pressure.

.3 Determine resistances and resistance factors in accordance with the Building Code of Ontario and CSA-S136-07.

.4 Design assemblies, components and attachment to meet Building Code of Ontario, Sentence 4.1.5.17.

.5 Design bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress effects due to torsion between lines of bridging. Collateral sheathing may not be used to help restrain member rotation and translation perpendicular to the minor axis.

.6 Maximum deflections under specified loads shall conform to the following:
.1 Wall studs supporting materials susceptible to cracking (e.g. masonry veneer, Portland cement plaster, ceramic tile) L/720. Wall studs supporting material not susceptible to cracking (e.g. metal cladding) L/360.

.7 Design components or assemblies to accommodate specified erection tolerances of the structure.

.8 The spacing of members shall not exceed the following: Wall studs: 400mm o.c.

.9 Allow for movement of the structure. Design wind bearing stud end connections to accommodate floor/roof deflections such that studs are not loaded axially.

.10 Connections between lightweight steel framing members shall be by bolts, welding or sheet metal screws.

.11 Resistances for sheet metal screws shall be based on the manufacturer's lower bound test values multiplied by the appropriate resistance factor $ø_c$, given in CAN3-S136.

.12 Conform to the requirements of specified fire rated assemblies.

1.4
Submittals

.1 Submit certified copies of mill reports covering chemical and mechanical properties, and coating designation of steel used in this work.

.2 Submit duplicate samples of mechanical fasteners. Provide corrosion resistance test data for the types of fastener coatings.

.3 Submit copies of engineering calculations or data verifying the capacity of the members and the ability of the assemblies to meet the design requirements. Submit manufacturer's load and section property tables.

.4 Submit copies of shop drawings.
.1 Each shop drawing submitted shall bear the stamp and signature of a qualified Professional Engineer registered in the Province of Ontario.
.2 Include all necessary shop details and erection diagrams. Indicate member sizes, locations, thicknesses exclusive of coating, coatings and materials. Include connection details for attaching framing to itself and for attachment to the structure. Show splice details where permitted. Indicate dimensions, openings, requirements of related work and critical installation procedures. Show temporary bracing required for erection purposes.
.3 Indicate design loads.

.5 Submit in conformance with Section 01 30 00.

.6 Submit copies of field review reports as required in 3.2.1.

1.5
Mock-Up

.1 Prepare 2.4m long mock-up of exterior wall metal stud assemblies for review.

.2 Provide in accordance with Section 01 45 00.

1.6
Storage

.1 Protect products from conditions which may cause physical damage or corrosion.

PART 2 - PRODUCTS

2.1
Exterior Wall
Framing System

.1 Structural Metal Stud Framing Components: Meeting CAN/CGSB 7.1-98 except as otherwise specified.

.2 All components to have hot dip Z275 (G90) galvanized coating to ASTM A653M-06a.

.3 All thicknesses are core thickness. Thicknesses are -0.00mm.

.4 Studs, and Tracks: Sheet steel conforming to ASTM A446M-01 and ASTM A653M-06a. Components up to 1.09mm (44mil) thick: min. fy; 230MPa (33ksi) unless noted otherwise. Components over 1.09mm (44mil) thick: min. f'y; 345MPa (50ksi) unless noted otherwise.

.5 Studs : Width indicated x 41mm (with 13mm return legs), C shaped. Web to be prepunched with cut-outs at max. 600mm o.c.; max. 38 x 100mm for studs < 102mm deep, max. 65 x 115mm for studs ≥ 152mm.
.1 Structural framing in heated space without insulation in stud space: min. 1.09mm (43mil).
.2 Structural framing with insulation in stud space: min. 1.37mm (54mil).
.3 Structural framing in canopies, unheated spaces and at all other locations: min. 1.37mm (54mil).

.6 Bottom and top track: Width to suit studs x 33mm not less than stud thickness, channel shaped, unpunched, and to requirements of 2.1.4.

.7 Bridging: 20 x 38mm x min. 1.54mm thick (54mil) cold rolled steel channel to CSA A82.30-M1980. Hot dip galvanized to 2.1.2.

.8 Girts: width indicated with min. 50mm legs from min. 1.22mm (48mil) thickness (nominal 18ga.) Z275 galvanized steel.

.9 Furring Channels: hat shaped, 22mm deep from min. 1.37mm (54mil) thickness Z275 galvanized steel.

.10 Fasteners: Use low profile head where screws will be covered by drywall. Length to provide not less than three exposed threads beyond joined materials.

.1 Corrosion resistance of screws shall meet the following:

.1 Max. 10% rust to ASTM B117: min. 190 hours, and

.2 Max 15% rust to Kesternich (FM #4470): min. 15 cycles.

.2 Acceptable Products include: “Climaseal”, “Climacoat”, “Sentri”, or “Spex”.

.3 Zinc plated, yellow zinc plated and phosphate coated fasteners not acceptable.

.11 Slide clips: Min. 1.81mm (68mil); Dietrich “Slide Clip” or “Fast Clip” or Bailey H.F.A.; min. 14ga.

.12 Caulking: Butyl; to requirements of Section 07 92 00.

.13 Zinc rich primer: To CAN/CGSB 1.181-99.

.14 The steel thickness exclusive of coating shall be marked on each member by embossing, stamping with indelible ink or by colour coding.

PART 3 - EXECUTION

3.1
Installation

.1 Cut all components squarely or at an angle to fit squarely against abutting members. No splices permitted in members under 6m in length. Do not crimp or cripple members to make connections.

.2 Make all field dimensions necessary to insure the proper fit of all members.

.3 Apply two continuous beads of butyl caulking at floor track. Locate one bead under track, one at front face of track. Conform to Section 07 92 00.

.4 Align tracks at floor and structure above and secure at maximum 400mm o.c. and max. 50mm from ends. Ramset tracks to concrete slabs, tack weld or Ramset to structural steel framing. Secure also within 50mm of double studs.

.5 Secure studs to abutting structure and to each side of structural steel stub columns. Secure at max. 300mm o.c. and max. 50mm from ends.

.6 Beside beams, floor edges and roof edges provide vertical web attachment with vertically sliding connection to structure. Provide hot dip galvanized steel shim plates as required.

.7 Place studs vertically at max. 400mm o.c., (300mm o.c. where indicated) or closer where required by design criteria. Place studs at abutting walls, and at each side of openings and corners.

.8 Ensure web cut-outs are not closer than 300mm from stud ends.

.9 Seat studs squarely in track with stud web and flange abutting the track web. Securely attach each stud flange to track flanges using low profile sheet metal screws. Provide additional stud end stiffening as recommended by manufacturer and as required to resist the applied wind shear.

.10 Provide continuous bridging channel in stud web cut outs. Design bridging to prevent stud rotation and translation about the minor axis. Locate at max. 1.2mm o.c. vertically. Connect each bridging channel to each stud using min. 38 x 38 x min.1.2mm (43mil) hot dip galvanized steel angles of length 25mm less than stud width. Screw each angle to each flange and to each bridging channel with min. two low profile sheet metal screws. Similarly, secure bridging to abutting structural elements.

.11 Provide two studs extending from floor to head track at each side of all openings that are wider than the stud centres specified. Secure studs together using means recommended by manufacturer.

.12 Erect tracks at head and sills of openings to accommodate intermediate studs. Secure tracks at each end to framing manufacturer's instructions. For openings wider than 1m add additional reinforcing as indicated or as additionally

recommended by manufacturer and required by engineering analysis.

.13 Splices:
.1 Studs: Splices not permitted.
.2 Tracks: Butt splice.
.3 Bridging: Lap 300mm and screw together with 2-#10 S.M.S. @ 25mm from each end.

.14 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs, ensure web openings are aligned.

.15 Co-ordinate erection of studs with installation of window/door frames and special supports or anchorage for work specified in other sections.

.16 Provide stud or bridging channel between studs for attachment of fixtures, cabinetry, equipment and other items attached to wall.

.17 Erect studs and tracks straight and plumb to tolerance of 1:1000 and plumb to 1:500. Space studs within 3mm of design spacing. The gap between the end of a stud and the web of a track shall not exceed 4mm.

.18 Touch up galvanizing scratched or burned off with one coat zinc rich primer. Torch cutting of members not permitted.

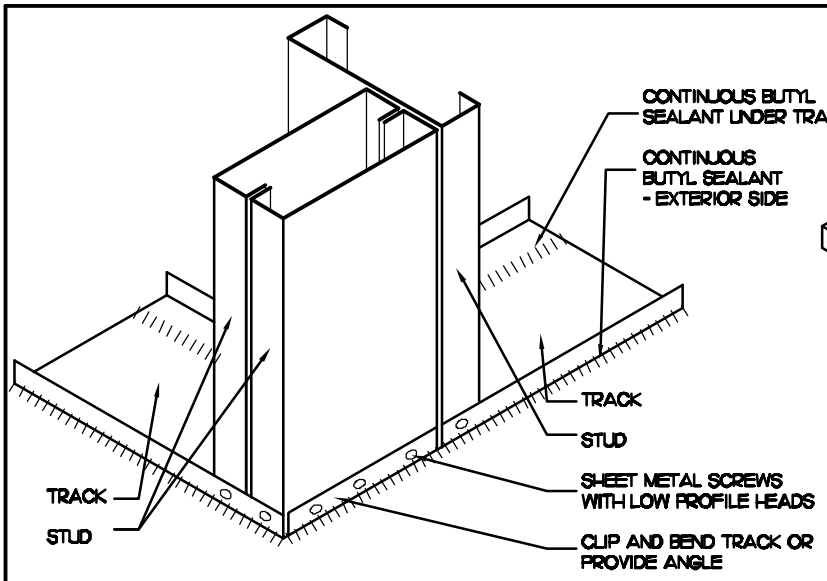
.19 Place insulation equal to that specified in Section 07 21 00 in all sill, jamb, header and double top track assemblies that will be inaccessible after their installation into the wall. Insure insulation is kept dry and not compressed.

.20 Construct in accordance with attached drawings 05 41 00-1 & 2.

3.2
Inspection

.1 The lightweight steel framing Design Engineer, responsible for the production of the shop drawings, shall provide periodic field review during construction and shall submit reports in accordance with item 1.4.6. The cost of this field review shall be paid for by the Contractor.

END OF SECTION



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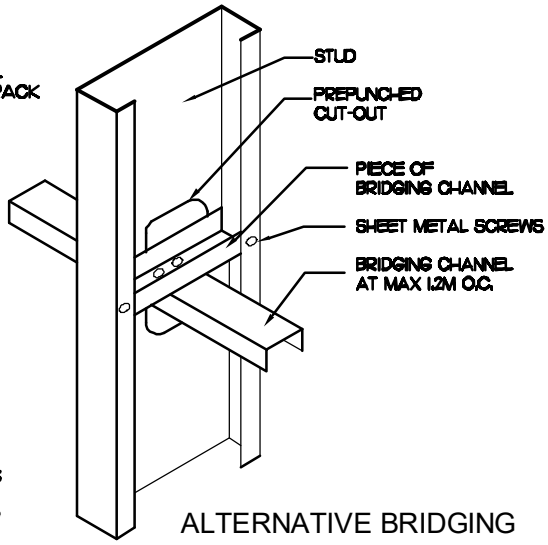
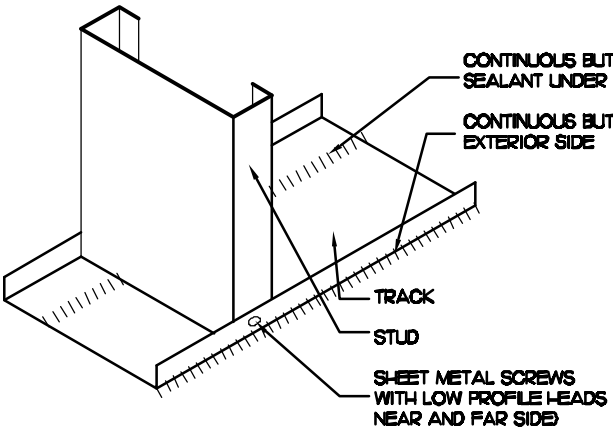
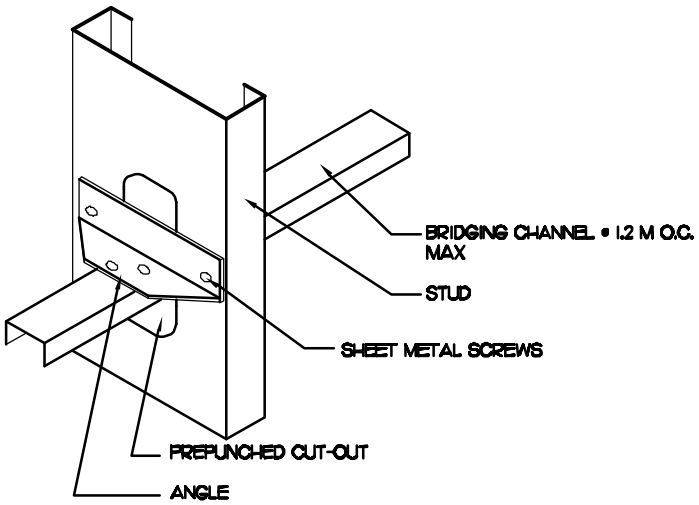


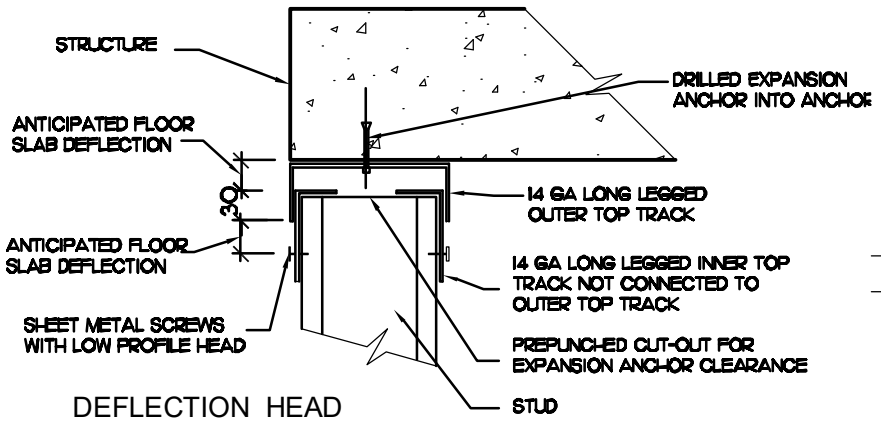
ALTERNATIVE BRIDGING



BASE



BRIDGING



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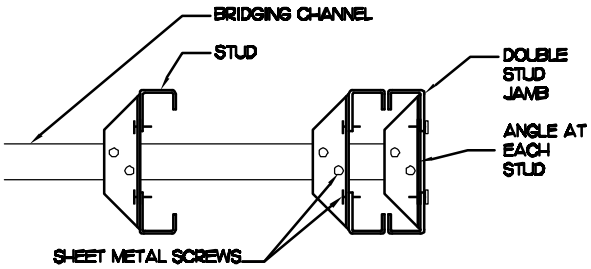

JAMB AT OPENING AND END OF BRIDGING

P&R

PYE & RICHARDS ARCHITECTS INC

824 MEATH STREET OTTAWA ONTARIO K1Z 6E8
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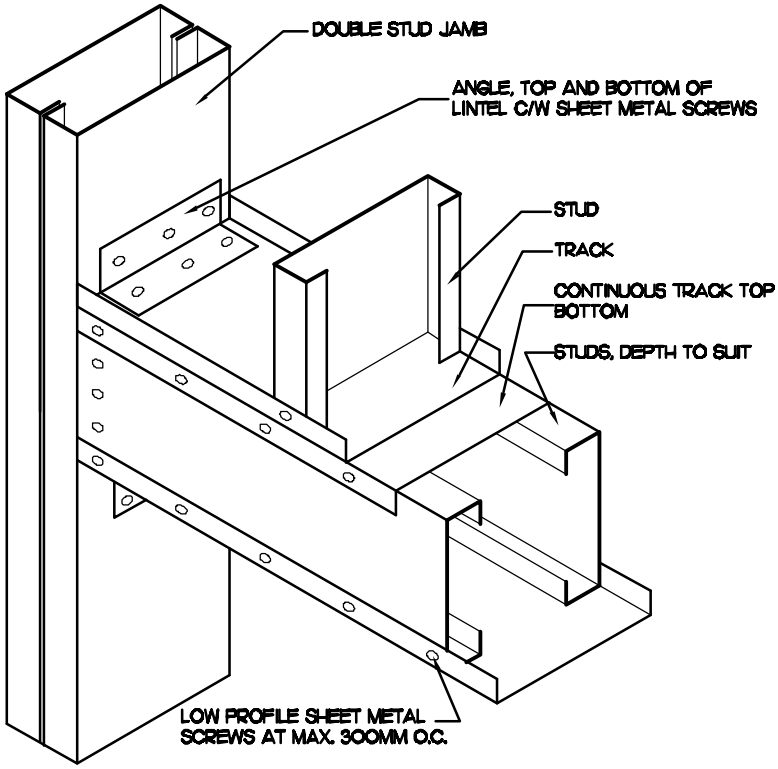
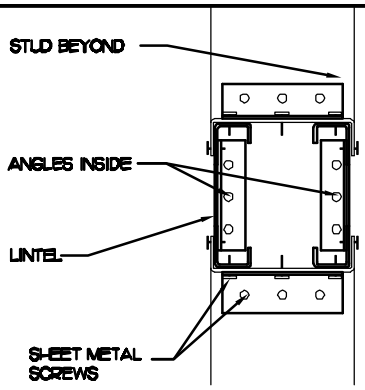
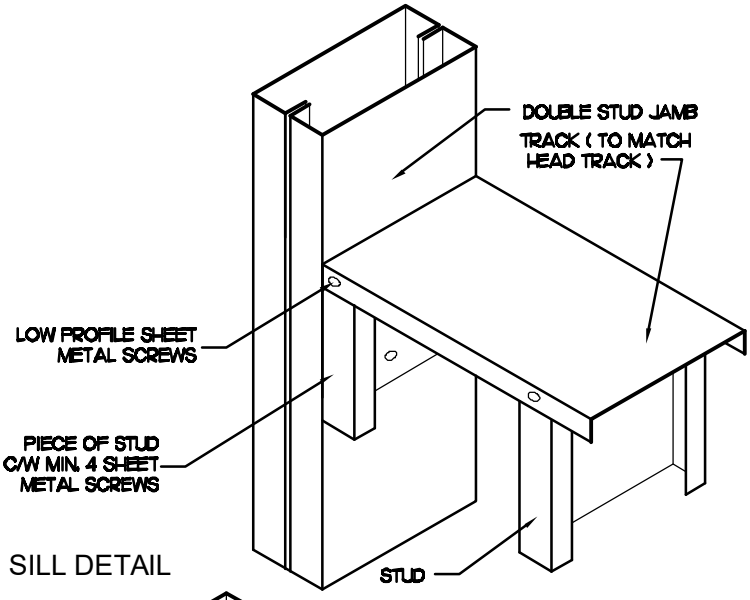
PROJECT: SURGENOR TRUCK CENTRE		DATE: DEC 4 2018	JOB NO.: 18-18
DRAWING: TYPICAL STRUCTURAL METAL STUD DETAILS TRACKS & BRIDGING		DRAWING NO.: 05 41 00-1	



TYPICAL
LINTEL DETAIL



LINTEL DETAIL
END VIEW



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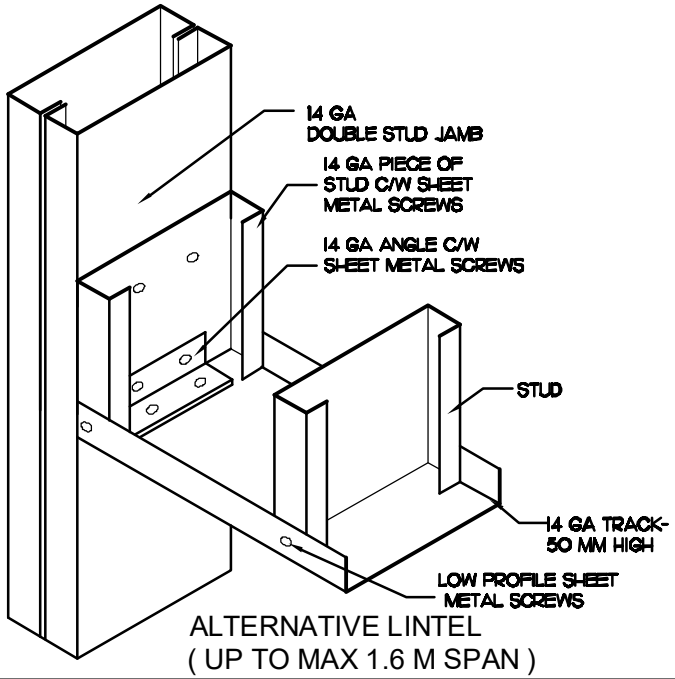
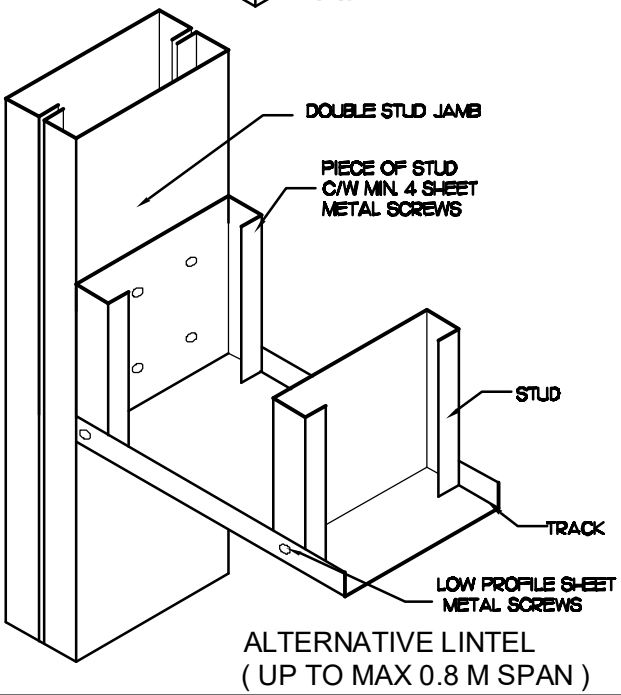


ALTERNATIVE LINTEL
(UP TO MAX 1.6 M SPAN)



ALTERNATIVE LINTEL
(UP TO MAX 0.8 M SPAN)

P & R

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WEBSITE: www.pyeandrichardsarchitects.com

PROJECT: SURGENOR TRUCK CENTRE		DATE: DEC 4 2018	JOB NO.: 18-18
DRAWING:	TYPICAL STRUCTURAL METAL STUD DETAILS LINTELS	DRAWING NO.: 05 41 00-2	

PART 1 - GENERAL

1.1 Related Work

.1 Installation of Anchors in Concrete and Masonry: Divisions 03 and 04

.2 Structural Steel Framing: Section 05 12 00

.3 Finish Painting: Section 09 91 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Reference Standards

.1 Do welding work to CSA W59-03 unless specified otherwise.

1.4 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00. Contract drawings are schematic and show in general the type of construction which shall be followed, but must not be considered as fabrication drawings.

.2 Clearly indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories. Provide applicable pull-out ratings for anchors.

1.5 Examination

.1 Examine all work upon which the work of this Section is dependent before starting operations. Notify Consultant of any faults found.

PART 2 - PRODUCTS

2.1 Materials

.1 Steel sections and plates: To CAN/CSA G40.21-04 Grade 300W. Architecturally exposed steel shall be new mill material free from pits and other surface imperfections.

.2 Steel Pipe: To ASTM A53M-04a standard weight, schedule 40, seamless.

.3 Welding Materials: To CSA W59-03.

.4 Bolts and Anchors: To ASTM A307-04.

.5 Shop Coat Primer (Interior): To CAN/CGSB 1.40-97.

.6 Galvanizing Primer (Exterior): Zinc rich ready mix to CAN/CGSB-1.181-99.

.7 Galvanizing: Hot dip galvanizing with a min. coating of 600 gm. zinc per sq.m. to CAN/CSA G164-M92 (R2003).

.8 Bituminous Paint: to CAN/CGSB-1.108-M89.

.9 Grout: Non-shrink, non-metallic, flowable, 24h Mpa 15, pull out strength 7.9 Mpa.

2.2
Fabrication

.1 Fabricate work square, true, straight, and accurate to the required size, with all joints closely fitted and properly secured.

.2 Items to be fabricated from steel unless otherwise noted.

.3 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Exposed connections to be same material, colour, and finish as base material on which they occur.

.4 Accurately form connections with exposed faces flush; mitres and joints tight.

.5 Grind or file exposed welds and steel sections smooth. Cap exposed ends of hollow sections.

.6 Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1

.7 Use self tapping "shake-proof" countersunk flat headed screws on items required to be assembled by screws.

.8 Where possible, work to be fitted and shop assembled, ready for erection.

2.3
Shop Painting

.1 Power Tool Clean interior surfaces in accordance with SSPC-S.P.2-82.

.2 Commercial Blast Clean exterior surfaces in accordance with, SSPC-S.P.6-82.

.3 Apply one coat of shop primer to ferrous metal items, with exception of stainless steel, and those to be galvanized or encased in concrete. Do not prime interior of steel pans.

.4 Apply second coat of primer in different colour to parts inaccessible after final assembly.

.5 Use primer unadulterated as prepared by manufacturer without thinning or adding admixtures. Paint on dry surfaces free from rust, scale, grease. Do not paint when temperature below 7 degrees celsius.

.6 Clean surfaces to be field welded, do not paint.

.7 Use zinc rich primer for items outside of exterior walls/roof, and for items within exterior walls, except as otherwise indicated.

.8 Galvanize work where noted.

.9 Isolate metals where necessary to prevent electrolysis between dissimilar metals. Use bituminous or epoxy isolation coating.

.10 Visual characteristics to conform to Section 09 91 00.

PART 3 - EXECUTION

3.1
Erection

.1 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.2 Provide suitable means of anchorage acceptable to Consultant, such as dowels, anchor clips, bar anchors, expansion bolts and shields, toggles.

.3 Exposed fastening devices to match finish and be compatible

with material through which they pass.

.4 Fastening devices to be non-hazardous rounded profiles and to be "shake-proof" and tamperproof.

.5 Make field connections with high tensile bolts to CAN/CSA S16.1, or weld.

.6 Hand items to be cast into concrete or built into masonry over to appropriate trades together with the necessary setting templates.

.7 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection.

.8 Touch up galvanized surfaces with zinc rich primer where burned by field welding.

3.2
Miscellaneous
Metalwork Items

.1 Examine the drawings and specifications and provide all miscellaneous metalwork items required for the proper execution of this project, including, but not limited to:
- Steel guard rails - zinc rich primer
- door threshold angles- galvanized-
- steel bollards - zinc rich primer

.2 Anchor items into backing at max. 600mm o.c. with 9mm diameter bolts except as otherwise called for.

3.3
Miscellaneous
Steel Brackets
Supports & Angles

.1 Supply for installation, by respective trades, steel brackets, supports, and angles as indicated. Drill for countersunk screws and anchor bolts. Prime paint except as otherwise noted.

.2 Install manufactured items in strict accordance with manufacturer's instruction.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Concrete Formwork: See Drawings

.2 Finish Carpentry: Section 06 20 00

.3 Air / Vapour Retarders at Roof Blocking Section 07 27 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
References

.1 Canadian Standards Association (CSA)
.1 CSA B111-1974 (R2003)Wire Nails, Spikes and Staples.
.2 CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shape Articles.
.3 CSA O121-M1978 (R2003) Douglas Fir Plywood.
.4 CAN/CSA-O141-91 (R1999) Softwood Lumber.
.5 CSA O151-M1978 (R1998) Canadian Softwood Plywood.

.2 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2004.

1.4
Source Quality Control

.1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administrative Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

1.5
Environmental Safety

.1 Use field applied preservatives in strict compliance with manufacturer's recommendations.

.2 Do not burn or bury preservative treated wood.

.3 Collect sawdust from cutting treated wood. Dispose of off site.

PART 2 - PRODUCTS

2.1
Lumber Materials

.1 Lumber: Unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with the following standards:
.1 CAN/CSA O141.
.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Machine stress-rated lumber is acceptable for all purposes.

.3 Glued end-jointed finger-joined lumber is not acceptable.

.4 Furring, blocking, nailing strips, grounds, rough bucks, fascia backing, sleepers:
.1 Use S4S material.
.2 Use spruce-pine-fir or Douglas fir-larch species except as noted.
.3 Board sizes: “Standard” or better grade.
.4 Dimensions sizes: “Standard” light framing or better grade.
.5 Post and Timber Sizes: “Standard” or better grade.

.5 Framing and board lumber: S-P-F species group, NLGA grade #2 or better S-dried.

.6 Cants, curbs, nailers for roofing: use northern species.

2.2
Panel Material

.1 Plywood: Douglas fir plywood (DFP): to CSA O121-M or Canadian softwood plywood to CSA O151. Thickness 19mm or as shown.
.1 Unexposed: sheathing grade sheathing
.2 Exposed: GIS except as indicated.
.3 Exterior grade: for roofing, wall openings, window sills and where noted.

2.3
Fastenings and Hardware

.1 In accordance with Part 9 of Ontario Building Code 2006 as supplemented by following requirements except where specific type is indicated.

.2 Nails, spikes and staples to OBC 9.23.3 except:

.1 Use common spiral nails and spiral spikes except where indicated otherwise.

.3 Bolts: 12.5mm dia. unless indicated otherwise, complete with nuts and washers.

.4 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive activated fastening devices recommended for purpose by manufacturer.

.5 Galvanizing: hot dip galvanizing with min. coating of 600g zinc/m² (2oz/ft²) to CAN/CSA G164.

.6 Except as otherwise noted, use galvanized steel fasteners for:
.1 Exterior work.
.2 Cants, curbs, parapets and blocking for roofing.
.3 Work in exterior wall cavities including in soffits, for window and door perimeter blocking, in canopies, and for wall strapping.
.4 Interior humid areas.
.5 Preservative treated and pressure treated wood.
.6 Cedar and redwood.

.7 Except for exterior work, “Climaseal” coating is acceptable in lieu of hot dip galvanizing.

.8 Electroplated galvanizing is not acceptable in lieu of hot dip galvanizing.

.9 Use surface fastenings of following types, except where specific type is indicated:
.1 To hollow masonry, plaster and panel surfaces use toggle bolt.
.2 To solid masonry and concrete use expansion shield with lag screw, jute fibre or 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.

2.4
Wood Preservative

.1 Pressure treated wood:
.1 Wood preservative to CSA 080.1-M1989 and supplements using ACQ preservative to obtain net retention of 64 Kg/cu.m. of wood.

PART 3 - EXECUTION

3.1
Rough Carpentry

.1 Provide and fit into place all furring, strappings, battens, studs, joists, sleepers, lagging, cant strips, grounds, nailers, blocking, rough bucks, curbs and framing shown on drawings or required for work of all trades. Include backing for Sections 06 20 00, 08 71 00, 10 21 14, and for handrails, wall stops, grab bars, plumbing fixtures.

.2 Blocking, strapping and other rough carpentry indicated shall not be regarded as complete and exact.

.3 Provide, fix with wedges, ease and finally remove when directed, all centrings, struts and supports for masonry and other work. Provide all bracketing, centring, grounds, etc., for sheet metal and other work.

.4 Fasten work securely to backing to support itself and anticipated superimposed loads. Space members uniformly.

3.2
Wood-Frame Construction

.1 Comply with requirements of Ontario Building Code, Section 9.23, except where specified otherwise.

3.3
Erection of
Framing Members

.1 Install members true to line, levels and elevations.

.2 Construct continuous members from pieces of longest practical length.

.3 Install spanning members with "crown-edge" up.

.4 Fur, frame and strap at max. 400mm o.c.

3.4
Furring and Blocking

.1 Install furring and blocking as required to space out and to support surface applied cupboards, casework, fittings,

accessories.

.2 Align and plumb faces of furring and blocking to tolerance of 1.600.

3.5
Nailing, Strips,
Grounds, Rough Bucks

.1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

3.6
Roof Cants, Nailers, Curbs

.1 Install wood cants, sleepers, nailers, curbs and other wood supports for roofing and sheet metal work, and roof mounted equipment as indicated.

.2 Secure wood blocking to concrete and masonry with galvanized 9mm dia. bolts spaced at max. 1200mm o.c.

.3 Secure wood blocking to steel deck with 5mm dia. screws having 16mm dia. heads; galvanized, stainless steel or “Climaseal” or “Sentri” coated. Use min. 2 staggered rows of nails/screws, each at max. 600mm o.c., but 300mm o.c. for 3.6 m from corners. Secure wood blocking together with min. 2 rows of hot dip galvanized nails penetrating nails penetrating min. 32mm. Locate fastenings within 200mm from ends of members.

3.7
Fasteners

.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.

3.8
Pressure Treated Wood

.1 Use pressure treated wood and plywood in the following conditions, except as otherwise noted.
.1 Where indicated.
.2 Exterior material below grade within 300mm of grade.
.3 Material exterior to building envelope (e.g. fencing, roof sleepers).
.4 Material framed into concrete below grade level.

.5 Shimming and blocking material associated with openings in exterior walls.

3.9
Field Treatment of
Pressure Treated Wood

.1 Apply two liberal applications of ACQ Pressure Treated preservative to ACQ treated materials where exposed by cutting, trimming, or boring. Dip ends for 3 minutes for each application.

3.10
Electrical Equipment
Backboards

.1 Provide backboards for mounting electrical equipment as indicated. Use 19mm thick plywood on 19 x 38mm furring around perimeter and at max. 300mm intermediate spacing.

3.11
Steel Roof Curbs

.1 Set in place, level on continuous solid wood blocking, and secure steel curbs to satisfaction of Division 23.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Rough Carpentry: Section 06 10 00

.2 Wood Doors: Section 08 14 00

1.2 General

.1 The requirements of Division 01 form part of this Section.

1.3 Reference Standards

.1 Do cabinetry and finish carpentry to Architectural Woodwork Standards of the Architectural Woodwork Institute (AWI), the Architectural Woodwork Manufacturer's Association of Canada (AWMAC), and the Woodwork Institute (WI), 1st Edition, 2009.

1.4 References

.1 American National Standards Institute (ANSI)
.1 ANSI A208.1-99, Particleboard.
.2 ANSI A208.2-02, Medium Density Fibreboard (MDF).

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-11.3-M87, Hardboard.
.2 CAN/CGSB-19.22-M90, Mildew Resistant, Sealing Compound for Tubs and Tiles.

.3 Canadian Standards Association (CSA)
.1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
.3 CSA O115-M82(R2001), Hardwood and Decorative Plywood.
.4 CSA O121-M78(R2003), Douglas Fir Plywood.
.5 CAN/CSA O141-(R2005), Softwood Lumber.
.6 CSA O151-(R2004), Canadian Softwood Plywood.

.4 National Electrical Manufacturers Association (NEMA)
.1 NEMA LD3-2005, High Pressure Decorative Laminates.

.5 National Hardwood Lumber Association (NHLA)
.1 Rules for the Measurement and Inspection of Hardwood and Cypress, January 2007.

.6 National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber 2003.

.7 Stainless Steel: To ASTM A167-99 (R2004), Type 304, AISI No. 4 finish.

1.5
Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Clearly indicate:
.1 Details of construction profiles, jointing, fastening, and other related details. Details to 1:5.
.2 Indicate materials, thicknesses and hardware.
.3 Location of each furniture unit. Utilize field dimensions.

1.6
Samples

.1 Submit samples in accordance with Section 01 30 00. [Submit within six (6) weeks of tender acceptance.]

.2 Submit samples of proposed hardware.

.3 Submit min. 450mm long samples of upper and lower cabinets to site for approval. If acceptable, sample may be incorporated into finished work.

1.7
Protection

.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.8
Examination and Coordination

.1 Examine all drawings and specifications to determine the extent of the work.

.2 Coordinate with other trades for incorporation of mechanical, electrical, or other items into work.

.3 Coordinate with Consultant for exact location requirements.

1.9
Product Handling

.1 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22°C.

.2 Store materials against dampness during and after delivery.

.3 Store materials in ventilated areas protected from extreme changes of temperature or humidity.

1.10
Maintenance Data

.1 Provide maintenance data for plastic laminate work for incorporation into Maintenance Manual specified in Section 01 30 00.

.2 Provide maintenance data for:
- .1 Plastic laminate and melamine.
- .2 Solid Surface.
- .3 Stainless Steel.

1.11
Warranty

.1 The warranty period stated in GC 12.3 Warranty, is with respect to the laminated plastic work, extended from one year to two years. Provide a written guarantee in the form specified in Section 01 78 36.

.2 The warranty to specifically guarantee that laminated plastic work will not warp, delaminate, open joints, or split.

PART 2 - PRODUCTS

2.1
Lumber Materials

.1 Softwood Lumber: To CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content of 7% for interior work, 12% for exterior work, yard lumber selected for paint finish, pine species, to AWMAC custom grade, “C” select or better (para 112C). Finger jointed material not acceptable.

.2 Hardwood: To National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 7% for interior; solid stock only.
- .1 Birch: To AWI/AWMAC custom grade, paint grade.

.3 Mat formed wood particle board: To ANSI A208.1, 19mm unless otherwise called for. Finish both sides as indicated.

.4 Hardwood plywood: To CSA O115, type II bond, min. 0.71mm veneer. Good two sides where exposed to view both sides, 19mm thick unless otherwise called for.

.5 Douglas Fir Plywood: To CSA O121 good two sides, select sheathing, 19mm thick unless otherwise called for. Use MDO face where exposed in finished work.

.6 Medium density fibreboard (MDF): to ANSI A208.2, density 769kg/m³ (48pcf.), 19mm thick unless otherwise called for. Use only where noted.

.7 Laminated Plastic:
.1 For Flatwork: To NEMA LD3, Type GP, Grade HGS,1.2mm thick.
.2 Backing sheet: min 0.5mm thick, sanded surface, of same manufacturer as facing sheets.
.3 For post formed work: To NEMA LD3-2005 Type PF, Grade HGP, 1.0mm thick, otherwise as for flatwork.
.4 Adhesive: As recommended by plastic laminate manufacturer.
.5 Manufacturers, colours and textures selected by Consultant.

.8 Melamine overlaid panel boards: Melamine overlay, 120g heat and pressure laminated with plastic resin to both sides of particle board core.

.9 Nails: To CSA B111; galvanized for exterior work, interior highly humid areas and for treated lumber; plain finish elsewhere.

.10 Wood Screws: to CSA B35.4, electroplated steel, type and size to suit application.

.11 Draw bolts and splines: As recommended by plastic laminate fabricator.

.12 Solid Surface:
.1 Cast, non-porous mineral filled acrylic polymer to ANSI Z124.3 or 6, Type 6. Max. Flame spread 25, max. smoke developed 30 to ASTM E84, as manufactured by DuPont.
.2 Adhesive: 2 part, inconspicuous, chemical bonding, non-

porous adhesive, as recommended by manufacturer.

.3 Colours:
- .1 Service counter Corian, “Antarctica”.
- .2 Women’s & universal washroom Corian, “Clamshell”.
- .3 Men’s washroom Corian, “Graylight”.

.13 Stainless Steel Counters:
- .1 1.6mm, Type 304, No. 4 finish stainless steel.

.14 Silicone sealant: mildew resistant to CAN/CGSB-19.22, clear.

2.2
Finishing Hardware with

.1 Supply and install all requisite items including:
- pilaster strips KV 255 or Roll-It 120
- pilaster clips, triangular, KV 239 or Roll-It 101, 4 per shelf
- door bumpers; clear plastic, round, 2 per door
- cabinet hinges; Berenson 849 or BLUM 94-550-01, opening, non-quick release.
- door and drawer pulls; HA 2653, GSH 935, or CBH 235. Finish 26D.
- drawer slides KV 1300, Roll-It 483 or Waterloo #3250.
- coat rods: 32mm dia. x 1.2mm steel, chrome plated, matching circular flanges.
- grommets on countertops; flanged ABS plastic sleeves c.w rotating cover with cable cutout; colour as selected.
- adjustable keyboard tray; Waterloo #6130D c/w #6221 tray (Waterloo Furniture Components 1-(519)748-5060).
- other items as indicated and as required.
- Finishes: C26D, C32D or C15, except as indicated.

2.3
Cabinetwork

.1 Fabricate casework to AWI/AWMAC custom grade.

.2 Cabinet doors to be AWI/AWMAC overlay type custom grade.

.3 Construct all cabinetry of hardwood plywood, min. 19mm thick except where noted otherwise. Use hardwood plywood throughout, except:

.1 Use exterior grade Douglas Fir plywood for counter tops with stainless steel finish.

.2 Use melamine finish on 19mm particleboard for semi exposed cabinet interiors, backs and concealed shelving.

.4 Provide plywood backs for all cabinet units, 6mm or as called

for on drawings.

.5 Drawers:
.1 Fronts: 19mm
.2 Backs and Sides: 12mm
.3 Bottoms: 12mm

.6 Set nails and screws, apply stained plain wood filler to indentations, sand smooth and leave ready to receive finish. Countersink screws, install matching hardwood plug where exposed; sand smooth and leave ready to receive finish.

.7 Provide shelf standards full height of gables.

.8 Install and adjust cabinet hardware for shelves, doors, and drawers. Install hinges using plastic sleeves to increase screw pull out resistance.

.9 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

2.4
Plastic Laminate
Application

.1 Comply with NEMA LD3, Annexes A and B and with plastic laminate manufacturer's installation instructions.

.2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment or other materials.

.3 Ensure adjacent parts of continuous laminate work match in colour, pattern, and texture.

.4 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. For site applied laminate offset joints in plastic laminate facing from joints in core.

.5 Form shaped profiles and bends as indicated, using post-forming grade laminate to laminate manufacturer's instructions.

.6 Use straight self-edging laminate strips for flatwork to cover exposed edge of core material. Chamfer exposed edges

uniformly at approximately 20 deg. Do not mitre laminate edges.

.7 Apply plastic laminate backing sheet to reverse side of core of plastic laminate work.

2.5
Solid Surface

.1 Reinforce seams in countertops with 50mm wide bevelled splice strip, same thickness as countertop. Provide adhesive over full entire contact surface of splice strip.

.2 Provide 75 to 100mm wide wood or plywood framing at front, back and gables.

.3 Provide cutouts for fixtures.

.4 Finish edges and cutouts to uniform smooth finish. Match visible cuts with specified finishes.

2.6
Stainless Steel
Counters

.1 Bond stainless steel to 28mm D.F. plywood core fold under. Seal underside of counter with black paint. Form front and side edges square. Provide no joints less than 3.0m on counter.

.2 Weld seams and polish all welds to match adjacent S.S surface.

PART 3 - EXECUTION

3.1
Installation: General

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.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.

.4 Fastening:

.1 Position items of finished carpentry work accurately, level plumb, square, true and fasten anchor securely.

.2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.3 Set interior finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.

.4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.5 Fit work securely, fit accurately. Expose no edge grain on finished surfaces unless part of the design.

3.2
Cabinetry Installation

.1 Install work plumb, true and square, neatly scribed to adjoining surfaces.

.2 Provide heavy duty fixture attachment for wall mounted units.

.3 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

.4 Use drawbolts and splines in countertop joints. Max. Spacing 450mm o.c. 75mm from edge. Make flush hairline joints.

.5 Provide cutouts for plumbing fixtures. Round internal corners, chamfer edges and seal exposed core.

.6 Adjust hardware for correct operation.

.7 Apply fine bead of clear silicone sealant to top of counters and splashbacks, and countertops where they abut walls and adjacent cabinets.

3.3
Protection

.1 Protect finish carpentry from damage until final inspection.

3.4
Hanging Doors

.1 Install all doors in frames as per Sections 08 11 00 and 08 14 00.

3.5
Installation of Hardware

.1 Prepare for and install all hardware specified under Section 08 71 00.

.2 Install washroom accessories supplied under Section 10 28 00 as specified.

END OF SECTION

PART 1 - GENERAL

1.1 General

.1 The requirements of Division 01 form part of this section.

1.2 Delivery, Storage and Handling

.1 Store rolls on end, on elevated platforms.

.2 Protect from weather and sunlight.

.3 Store between 16 and 48°C.

1.3 Environmental Requirements

.1 Apply and cure materials only within acceptable application temperature range determined by manufacturer.

.2 Apply membrane in dry weather conditions to dry surfaces. Allow concrete and masonry to dry min. 24h. after being wet.

PART 2 - PRODUCTS

2.1 Dampproof Flashing

.1 Dampproofing Flashing: self-adhesive rubberized asphalt with cross laminated polyethylene face film. Acceptable Products: Bakor: Blueskin TWF.

.2 Primer: as recommended by flashing manufacturer for optimum performance.

.3 Mastic: as recommended by flashing manufacturer.

PART 3 - EXECUTION

3.1 Installation of Dampproof Flashing

.1 Install flashings over openings in exterior walls.

.2 Install flashings in masonry in accordance with CAN3-A371-04 and as specified herein.

.3 Install flashings under exterior siding resting on foundation walls, slabs, shelf angles and steel angles over openings.

.4 Install flashings under weep hole courses and as indicated.

.5 Prepare substrates so they are dry, clean, uncontaminated, dust and oil free.

.6 Prime substrates at rates recommended by manufacturer and allow to dry min. 30 min. Reprime if surfaces not covered that day.

.7 In cavity walls, carry flashings from within 13-25mm of front edge of veneer under outer veneer, then up backing not less than 200mm.

.8 Continuously bond flashing to backing using a roller. Cut out and replace areas with blisters, folds, fishmouths, tears or punctures.

.9 Lap under wall air barrier or wind barrier.

.10 Lap joints 50mm.

.11 Apply continuous bead of mastic to top or leading edge.

.12 Install dampproof flashings in other locations indicated.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1	Firestopping:	Section 07 84 00
.2	Roof Insulations:	Section 07 52 00
.3	Insulation of Window Perimeters	Section 08 51 00
.4	Acoustic Insulation:	Section 09 21 00
.5	Insulation of Mechanical Work	Divisions 22 and 23

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 References

.1 American Society for Testing and Materials International, (ASTM).
.1 ASTM E96-00e, Test Methods for Water Vapour Transmission of Materials.

.2 Underwriters Laboratories of Canada (ULC).
.1 CAN/ULC-S114-05, Standard Method Test for Determination of Non-combustibility in Building Materials.
.2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
.3 CAN/ULC-S702-97, Standard for Mineral Fibre Insulation for Buildings.
.4 CAN/ULC-S710.1-05, Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Material Specification.
.5 CAN/ULC-S710.2-05, Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 2: Installation.
.6 CAN/ULC-S711.1-05, Standard for Thermal Insulation - Bead - Applied Two Component Polyurethane Air Sealant Foam, Part 1: Material Specification.
.7 CAN/ULC-S711.2-05, Standard for Thermal Insulation - Bead - Applied Two Component Polyurethane Air Sealant Foam, Part 2: Material Specification.

1.4
Delivery and Storage

.1 Deliver materials in undamaged condition, in original sealed wrappings or containers with manufacturer's labels intact. Store material off the ground and under cover. Protect plastic insulation against sunlight.

1.5
Safety Requirements

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:
.1 Workers must wear gloves, dust masks, long sleeved clothing, and eye protection when applying foam insulation.
.2 Workers must not eat, drink or smoke while applying foam insulation.

1.6
Inspection

.1 Notify General Contractor as soon as insulation work is complete and ready for inspection by Consultant. Just prior to completion of insulation work advise construction manager that insulation work may not be covered up prior to review by Consultant.

PART 2 - PRODUCTS

2.1
Materials

.1 Cavity Wall Semi-Rigid Mineral Fibre Insulation: To CAN/ULC S708, Type 2, Class 4, 64 kg/m^2 density, min. RSI = 0.75/25.4mm, flame spread max. 25 to ULC-S102M. Acceptable products: Roxul "Rockboard 40", Roxul "Cavity Rock" or Fibrex CWB45.

.2 Rigid Insulation: Polystyrene to CAN/ULC-S701, Type 4, or Dow Cavitymate, or Celfort 200, RSI = 0.87/25.4mm, square edged.

.3 Perimeter Insulation: polystyrene to CAN/ULC-S701, Type 4, min. compressive strength 210 kPa in 600 x 2400mm boards, ship lap edges; RSI = 0.88/25.4mm, min. 75mm thick except as otherwise indicated or directed.

.4 Batt insulation: Glass fibre or mineral wool flexible batts to CAN/ULC-S702, unfaced, RSI or thickness as indicated. 400mm wide purpose made for fitting between steel studs.

.5 Rock Wool: Non-combustible mineral fibre fire-stopping insulation to requirements of Section 07 84 00.

.6 Mastic Adhesive: Permanently flexible, synthetic rubber base, solvent type, trowel consistency, compatible with rubberized asphalt air/vapour barrier reinforcement. In the cured state the vapour transmission shall equal or better the insulation board. Physical Properties:
Solids content:: 73% by weight
Density: 1.2kg/litre
Dry time: initial 4 hrs. / set through 48 hrs.
Service temperature at glue line: -40°C. to 60°C.
Application temperature: -12°C. to 40°.C.
Long term flexibility: to CGSB 71-GP-24M; no fracturing
Permeance: ASTM 96 for 3mm net film: 1.7ng/Pa m².s
Example: Bakor Air-Bloc 21

.7 Mechanical Fasteners:
.1 Impale type, perforated 50 x 50mm cold rolled carbon steel 0.8mm thick, adhesive backed, spindle of 2.5mm dia. annealed steel, length to suit insulation 25mm dia. washers of self-locking type. Mechanically fasten to steel studs as per manufacturer's recommendations.

.8 Expanding Foam Insulation:
.1 One Component Polyurethane: to CAN/ULC-S710.1.
.2 Two Component Polyurethane: to CAN/ULC-S711.1, low expansion, non-shrinking.
.3 Primers: in accordance with manufacturer's recommendations for surface condition.

PART 3 - EXECUTION

3.1
Workmanship

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight to electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation, other than Rock Wool, minimum 75mm from heat emitting devices such as recessed light fixtures, and minimum 50mm from side walls of CAN4-S604, Type A,

chimneys, CAN/CGA-B149.1 and CAN/CGA-B189.2 Type B and L vents and generator exhaust pipes.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Install materials in accordance with manufacturer's instructions.

.8 Do not enclose insulation until it has been reviewed by Consultant.

.9 Notify the General Contractor that plastic insulation must be protected against sunlight within seven days exposure. Any yellowing boards must be replaced.

.10 Do not compress insulation to fit into space.

.11 Do not use polystyrene insulation on walls or ceilings inside of entrance/exit canopy soffits.

3.2
Installation of Rigid and Semi-Rigid Insulation

.1 Ensure substrate is sound, smooth, clean and dry.

.2 Where air and vapour barriers provided by others:
.1 Apply adhesive to substrate for semi-rigid insulation in min. 150mm wide stripes centred along all joints.
.2 Apply adhesive to polystyrene and rigid insulation boards in continuous serpentine pattern from edge to edge and around perimeter of boards.
.3 Butter edges of rigid polystyrene insulation boards completely across full depth with adhesive.

.3 Where air and vapour barriers not provided by others:
.1 Apply continuous bed of adhesive, min. 3mm thick to substrate on warm side of insulation.
.2 Butter edges of rigid polystyrene insulation boards completely across full depth with adhesive.

.4 Prior to skinning of adhesive, embed insulation into adhesive or install insulation onto substrate.

.5 Use mechanical fasteners to hold insulation in place until adhesive is set. Use sufficient fasteners to prevent sagging.
.1 In cavity walls, use “Wedge-Lok” or Fero “ISP” fasteners located so that each board is held by at least 4 fasteners. (1 fastener per 0.4m² of board.)
.2 Where “Wedge-Lok” or Fero “ISP” fasteners cannot be used, use impale type fasteners at min. rate of 1 fastener per 0.4m² of board.
.3 On ceilings, soffits and underside of horizontal substrates, double the quantity of mechanical fasteners required for walls.
.4 Mechanically fasten impale fasteners to steel, concrete, wood or masonry substrate. Cut off fastener spindle 3mm beyond disc.
.5 Fasteners are not required along those edges of boards secured by Z girts.

3.3
Installation of
Perimeter Insulation

.1 Ensure foundation wall is smooth and flat with ridges and bumps removed.

.2 Apply perimeter insulation with adhesive. Apply adhesive to insulation boards in continuous serpentine pattern from edge to edge and around perimeter of boards.

.3 Provide mechanical fasteners to hold insulation in continuous contact with foundation until adhesive is set.

.4 Fill gaps behind insulation with additional adhesive or expanding foam insulation.

.5 Provide perimeter insulation on perimeter foundations to min. 600mm below grade.

3.4
Installation of
Batt Insulation

.1 Install where indicated.

.2 Install batts between studs. Fit into stud and track recesses, behind electrical boxes and conduit. Leave no spaces in front of or behind batts.

.3 Fill gap between top of non-fire separation concrete block walls and slab above with batt insulation. Fill gap for full wall thickness.

3.5
Installation of Expanding Foam Insulation

.1 Install expanding foam insulation in accordance with
.1 CAN/ULC S710.2 for one component insulation,
.2 CAN/ULC S711.2 for two component insulation, and
.3 Manufacturer's printed instructions. Use primer where recommended by manufacturer.

.2 Fill inside of open perimeter voids of metal window, door and louvre frames and at other exterior wall interruptions with one part foam insulation.

.3 Continuously fill around perimeters of metal window, door and louvre frames and at other exterior wall interruptions to form air barrier connection between frames and wall air barrier.

.4 Fill open voids of exterior wall interruptions indicated with foam insulation.

.5 Fill open voids in exterior wall insulation as required to maintain continuity of insulation.

.6 Continuously fill voids to form air barrier connection between encapsulating construction.

.7 Ensure surfaces are dry and free of dust, oil, grease, frost, loose debris. Provide temporary bracing required to prevent bowing of adjacent frames. Mask adjacent exposed surfaces against damage.

.8 Provide adequate ventilation and protective apparel. Minimum application temperature - 5°C.

.9 Fill gaps, cracks, holes with foam. Make allowance for post expansion of foam.

.10 Do not apply foam to thickness, depths or volumes or within confined spaces which do not allow for full and permanent curing of foam. Apply in sufficiently thin layers, from closely spaced access points and with sufficient exposure to atmosphere to allow full and permanent curing of foam.

.11 Allow each layer to cure before next layer applied.

.12 Cut back excess foam after curing. Tool foam only when tack free.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work .1 Air Barriers; Bituminous: Section 07 27 00

1.2
General .1 The requirements of Division 01 form part of this section.

PART 2 - GENERAL

2.1
Vapour Retarders .1 Polyethylene film to CAN2-51.34-M86: min. 0.15mm thick (6 mil).

.2 Sealant for polyethylene film: non-hardening acoustic sealant to CGSB 19-GP-21M.

.3 Moulded box air barriers: factory moulded, semi-rigid, polyethylene box for use with recessed electrical switches and outlet boxes.

PART 3 - EXECUTION

3.1
Installation of Air/Vapour Barriers/ Retarders General .1 Ensure services are installed, reviewed and inspected prior to installation of retarder. Apply continuous air/vapour barriers where typically indicated. Lap joints min. 150mm and continuously seal. Install air/vapour barriers continuous on each plane without creases or overstretching.

.2 Fit air/vapour barriers tightly right up or around all interferences. Lap vapour retarders around openings.

.3 Repair and seal all punctures and tears. Seal around all interruptions and penetrations and at perimeter.

.4 Preserve continuity of vapour retarders.

.5 Fill and reinforce gaps in substrate as recommended by manufacturer of membrane.

.6 Install under roof curbs, at roof perimeter and at penetrations, and where detailed.

.7 Coordinate installations with work of Division 04 and Sections 06 10 00, 07 21 00, 07 27 00, 08 52 00 and Division 26 to ensure continuity of vapour retarder from wall to roof, window to wall, and around roof and wall penetrations.

3.2
Installation of Polyethylene Vapour Retarders (Floors)

.1 Install under all interior slab-on-grade over the granular base. Lay immediately before reinforcing mesh is installed. Lap joints 300mm and continuously seal with sealant.

3.3
Inspection

.1 Do not cover vapour retarders until inspected by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Insulation Adhesive and Fasteners: Section 07 21 00

.2 Sheet metal air barrier: Section 07 62 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
Delivery, Storage
and Handling

.1 Deliver materials in manufacturer's original, unopened packaging with all labels in tact.

.2 Store products on raised platforms and protect with waterproof coverings. Store rolls on end. Do not double stack.

.3 Store materials to maintain temperatures below 38°C.

.4 Handle materials to prevent tearing, puncturing and other damage.

1.4
Environmental
Requirements

.1 Apply and cure materials only within acceptable application temperature range determined by manufacturer. Select a membrane system which is best suited for the expected application conditions. Use the same system throughout entire project. Equivalent torch-on or low temperature self-adhesive membranes will be considered if required by environmental conditions.

.2 Apply membrane in dry weather conditions to dry surfaces. Allow concrete and masonry surfaces to dry min. 24 hours following rain.

.3 Ensure adequate ventilation for priming.

1.5
Coordination

.1 Coordinate work of this section with related work including windows, doors and other penetrating elements, sealants, insulation, roofing and other air barriers.

PART 2 - PRODUCTS

2.1
Materials

.1 Self adhesive Air/Vapour Barrier Sheet Membrane ("Peel & Stick"): rubberized asphalt membrane, min. 1.0mm thick, self-adhesive, having the following properties:
.1 Air Permeance: max 0.01 1/s/m² @ 75Pa to ASTM E283-83.
.2 Vapour Permeance: max. 2.8ng/Pa.S.m² to ASTM E96, Method B.
.3 Tensile Strength: min. 85N/5cm to CGSB 37-GP-56M.
.4 Elongation: min 40% to CGSB 37-GP-56M.
.5 Cold Temperature Flexibility: to -30°C to CGSB 37-GP-56M.
.6 Service Temperature: -30°C to 60°C.
.7 Acceptable Products:
.1 Bakor “Blueskin SA”.
.2 IKO “Aquabarrier AVB”.
.3 Soprema “Sopra Seal Stick 1100".
.4 Meadows Sealtight “Air Shield”.

.2 Self Adhesive Air/Vapour Barrier Sheet Membrane ("Peel & Stick") sanded surface: SBS modified bitumen, reinforced, min. 1.5mm thick self adhesive, sanded top surface, having the same properties as item 1 except:
.1 Elongation: min. 4% to CGSB 37-GP-56M.
.2 Acceptable Products:
.1 Bakor "Vedagard".
.2 Domtar "Eave Shield".
.3 Soprema Seal "Elastobond".

.3 Primer: as recommended by membrane manufacturer for optimum performance.

.4 Mastic, Adhesives, Joint Backing: as recommended by membrane manufacturer.

.5 Accessories: as recommended by membrane manufacturer.

.6 Joint Filler Rope: closed cell foam to standards of Section 07 92 00.

PART 3 - EXECUTION

3.1
Preparation

.1 Allow concrete, masonry, and cement plaster to cure and dry before applying membrane; Min. 7 days for sheet membrane.

.2 Prepare substrates so they are dry, clean, smooth, stable and free of voids, spalled areas, loose aggregates, sharp protrusions, oil, wax or other contaminants that could adversely affect membrane adhesion and performance.

.3 Prime areas to receive sheet membrane. Apply primer at rate recommended by membrane manufacturer. Allow primer to dry 30 minutes. Re-prime where primed surface not covered by membrane within 24 hours.

.4 Fill large open joints with flexible joint backing if recommended by membrane manufacturer.

3.2
Installation of Air/Vapour Barriers: General

.1 Apply continuous air/vapour barrier where typically indicated. Firmly adhere to substrates.

.2 Apply air/vapour barrier membrane to manufacturer's recommendations.

.3 Fit air/vapour barrier tightly right up or around all interferences. Seal around all interruptions and penetrations and at perimeter.

.4 Repair and seal all punctures and tears.

.5 At all details, take extra care to ensure continuity of membrane.

.6 Fill and reinforce gaps in substrate as recommended by manufacturer of membrane.

.7 Preserve continuity of air/vapour barrier.

.8 Coordinate installations with work of Division 04 and Sections 06 10 00, 07 11 20, 07 21 00, 07 26 00, 07 52 00, 07 62 00, 07 92 00, 08 51 00, 09 21 00 to ensure continuity of air/vapour barrier from wall to roof, window to wall, wall to wall, and around roof and wall penetrations.

3.3
Installation of
Membrane

.1 Lap joints min. 50mm and continuously seal. Lap joints in direction of water flow.

.2 Roll self-adhesive type membranes firmly and completely immediately after each sheet is applied to ensure full adhesion to substrate.

.3 Apply heavy pressure to terminating edges to assure positive adhesion at edges.

.4 Slit fishmouths and buckles, repair defects with additional ply of membrane overlapping 50mm.

.5 Repair and seal all punctures, tears, gaps, and inadequate laps. Seal around masonry ties and all penetrations with mastic.

.6 Trowel on mastic to terminations of self-adhesive type membranes at end of each day's work.

.7 Reinforce inside and outside corners as recommended by manufacturer.

.8 At large gaps, slightly loop membrane to accommodate expected movement.

3.4
Installation of
Air Vapour Barrier

.1 Apply bituminous air/vapour barrier membrane:
.1 To exterior walls of buildings to provide continuous air/vapour barrier except as otherwise noted.

.2 Apply bituminous air/vapour barrier membrane:
.1 To joints in sheet metal air barriers.
.2 To be continuous with sheet metal air barriers.
.3 To penetrations in exterior walls not otherwise sealed so as to provide air barrier. Apply sheet membrane onto sides of penetration and then onto exterior face of back up wall

construction.

.4 To lap over onto top edge dampproof flashing; min. 75mm.

.5 Under all window frames and their metal sills and up abutting jambs of windows and sills.

.6 As indicated.

.3 Apply sanded bituminous air/vapour barrier membrane, in locations where roofing membranes will be applied directly over top of bituminous air/vapour barrier, apply sanded surface type bituminous air/vapour barrier in stead of plastic film surfaced type.

3.5
Inspection

.1 Do not cover air/vapour barriers until inspected and approved by Consultant.

END OF SECTION

COMPOSITE STEEL SIDING

1. General:

1. The requirements of Division 01 form part of this section.
2. Design and provide wall system:
   - in accordance with NRC "Rain Screen Principles".
   - to OBC, CAN/CSA-S136: max. 1/180 deflection.
   - to min. R 22
   - to accommodate specified erection tolerances of structure
   - to accommodate predictable movements without water penetration, distortion, or damage to joints, seals or fasteners.
   - to max. tolerance of 10mm/m and cumulative max. 20mm/m in any plane. Max. offset of abutting members 0.75mm.
3. Submit shop drawings, stamped by a P. Eng. Registered in the Provide of Ontairo.
4. For Section 07 42 19, warranty provisions of General Conditions and relevant Supplementary Conditions to 2 years. Provide acceptable written warranty for same in accordance with Section 01 78 36. Specifically guarantee against deformation of panels, failure of fasteners or finish, deflection beyond that specified, discolouration.

2. Materials:

1. Sheet steel: To ASTM-A653-04a, 23MPa, Grade A, structural quality, galvanized, thickness of base metal as noted.
2. Exterior steel: Steel sheet with 8000 Series factory precoated paint finish to CSSBI Bulletin #7, 1979. Min. 0.61mm (24ga.). Profile: Ideal Roofing "Urban Accent " or approved equivalent. Colour: ID 8306 Charcoal.
3. Thermal spacer: Fibreglass thermal spacer, 100mm depth, manufactured by Cascadia Windows Ltd. e-mail: cascadiaclip@cascadiawindows.com. Fasteners: Master Gripper screws with DT coating by Leland Industries, or equivalent. Spacing of thermal clips as per engineer's recommendations.
4. Sub Girts: Min. 1.2mm (18ga.) sheet steel with Z275 galvanizing.
5. Sealants: Colour matched acrylic where exposed, non-skinning butyl where concealed.
6. Fasteners: Stainless steel, concealed. Where exposed nylon head colour same as adjacent sheet and with neoprene washers.
7. Sheet metal accessories: some material and finishes exterior sheet but min. 0.61mm (24ga.).
8. Gaskets: closed cell polyurethane foam, adhesive on two sides.

3. Execution:

1. Provide all required girts, fasteners, trim, flashing, cutouts, accessories and sealants. Make installation neat, weatherproof, resistant to environmental forces and to accommodate building and component movement.
2. Fasten components at max. 300mm o.c.
3. Apply isolation coating to metal surfaces in contact with cementious surfaces, dissimilar metals.
4. Provide notched closures and provide sealed back up gaskets to maintain weather tightness and allow drainage.
5. Cut and flash around all openings.
6. Make corners square and surfaces straight and in plane. All components to be colour matched. No lap joints permitted.
7. Finished surfaces shall be free from buckling, wrap, wave, dents, oil-canning or other defects.

- END -

PART 1 - GENERAL

1.1
Related Work

.1	Structural Metal Stud Framing	Section 05 41 00
.2	Sheathing	Section 09 21 00
.3	Self-Adhesive A/V Membrane	Section 07 27 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
Design Criteria

.1 Design metal cladding wall system to provide for thermal movement of component materials caused by ambient temperature range of 80 °C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.2 Accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, nor any bowing, buckling, delamination, oil canning, excessive stress on fasteners, damage to infills, racking of joints, breakage of seals, water penetration, or other detrimental effects.

.3 Design members to withstand dead load and wind loads calculated in accordance with OBC (100 year probability)and applicable local regulations, to maximum allowable deflection of 1/180th of span. Min. acceptable wind load 0.96kPa negative and 1.40kPa positive. System to withstand design loads without rattling, vibration, excessive deflection of panels, overstressing of fasteners, clips and other detrimental effects.

.4 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with NRC "Rain Screen Principles".

.5 Design wall system to accommodate specified erection tolerances of structure and framing.

.6 Tolerances:
.1 Maximum deviation from vertical and horizontal alignment of erected panels 6mm in 6m.
.2 Maximum offset from true alignment between adjacent members, abutting end to end, in line; 0.75mm.
.3 Maximum concave/convex distortion: 1.5mm.

.4 No rises and falls across the panels (no local bumps and depressions).

.7 Maintain uniformity of joint size throughout installation. Align joints.

.8 Design cladding system to be weathertight.

.9 Design system to permit individual and easy replacement of damaged panels.

.10 Composite Aluminum Panels: Class A to ASTM E84.

1.4
Quality Assurance

.1 Manufacturer of aluminum panels shall have minimum 5 years continuous experience in fabrication of aluminum panels.

.2 Installation of aluminum panel system: by installers currently certified by manufacturer of system used and with experience on min. 5 similar aluminum panel projects of equal or larger size than this project.

.3 Application of panel finish to aluminum: by a certified licensee of the Paint manufacturer having min. 5 years experience in the application of PVF2 finishes on aluminum.

1.5
Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Include plans, elevations, section and details of all work in this section. Include dimensions, wall openings, large scale head, jamb, sill, column, parapet, bottom details, materials, thicknesses, joint locations, large scale jointing and sealing details, finishes, anchor and fastening details and locations, deflection and thermal movement provisions, periphery, and interfaces, compliance with design criteria and requirements of related work.

.3 Indicate all necessary construction and erection data required for complete site installation.

1.6
Samples

.1 Submit duplicate samples in accordance with Section 01 30 00.
.1 180 x 250mm colour and gloss samples of the specified finishes.

.2 Min. 150 x 150 sample of panel edge and corner detail.
.3 Colour samples of sealants.

1.7
Mock-Up

.1 Erect mock-up in accordance with Section 01 30 00.

.2 Erect mock-up on site incorporating complete system, utilizing min. four full sized panels and including outside corner.

1.8
Product Data

.1 Submit product data for cladding system materials and finishes. Include characteristics, performance criteria, limitations.

1.9
Maintenance Data

.1 Provide data for cleaning and maintenance of panels for incorporation into Maintenance Manual specified in Section 01 30 00.

1.10
Delivery and Storage

.1 Protect panel faces with a plastic film adhered to panel in accordance with panel manufacturer’s recommendations.

.2 Transport components in a manner precluding damage.

.3 Remove all units which are cracked, bent, scratched, or chipped beyond repair or otherwise damaged and replace with new.

.4 Store materials off ground, under waterproof non-staining protection and protected from physical damage.

.5 Do not expose panels with strippable film to direct sunlight or extreme heat.

1.11
Warranty

.1 The warranty period stated in GC 12.3 - Warranty and relevant Supplementary Conditions is with respect to this section of the work extended from one year to two years. Provide a written warranty in the form specified in Section 01 78 36.

.2 Provide manufacturer's 5 year warranty against delamination of the composite aluminum panels.

.3 Provide manufacturer's 10 year warranty against blistering,

flaking, cracking or peeling of paint finish.

PART 2 - PRODUCTS

2.1
Aluminum
Panel Materials

.1 Composite panels: Thermoplastic core sandwiched between two aluminum sheets, formed in a continuous process without glue or adhesives.
.1 Thickness: min. 4mm.
.2 Core: Thermoplastic resin core.
.3 Aluminum face sheets:
.1 Thickness: min. 0.50mm.
.2 Alloy: AA-3003 or 3105-H25 for coil coated sheets and backer.
.4 Weight: 5.6 kg/m^2.
.5 Bond Integrity: to ASTM 1781-76 and ASTM C481, Cycle B; min. 40 in-lb.in (peel strength).

.2 Aluminum extrusions: Alloy AA-6063-T5. Purpose made male and female attachment system.

.3 Concealed sealants: One-component, butyl-polyisobutylene polymer base, solvent curing to CGSB 19-GP-14M-1984.

.4 Perimeter sealants: One-component, silicone base, neutral cure to CAN/CGSB-19.13-M87. Type 2 (non-sag), movement class 50, colour as selected.

.5 Joint Filler Strips: same material as panels. Colour: Same as panels.

.6 Accessories:
.1 Clips and fasteners: Aluminum extrusion, min. 3mm thick, concealed, in accordance with manufacturer's recommendations.
.2 Screws: Cadmium plated Type 18-8 stainless steel where exposed, stainless steel or “Climaseal” coated where fully concealed.
.3 Stiffeners: Aluminum extrusions, min. 3mm thick, in accordance with manufacturer's recommendations.
.4 Shims: In accordance with manufacturer's recommendations; ABS plastic between carrying extrusions and sub-girts; elsewhere, aluminum.
.5 Pop rivets: Stainless steel.

.7 Isolation coating: Alkali resistant bituminous paint.

2.2
Aluminum
Panel Fabrication

.1 Factory fabricated. Fabricate panels without joints at outside corners. Return all edges.

.2 Tolerances:
.1 Panel bow: Maximum 0.8% of panel dimension in width and length, up to max. 4.7mm.
.2 Deviation from squareness max. 4.7mm difference in diagonal dimensions.
.3 Width or Length: ± 0.8mm up to 1.2m, and 1.5mm over 1.2m.
.4 Panel lines, breaks and angles: True with surfaces free from warp or buckle, and finish unblemished.

.3 Provide panel stiffeners as required to meet tolerances. Provide panel stiffeners at panel cut outs and penetrations. Adhere to manufacturer's recommendations.

.4 Use single colour coil paint run for all composite panels on the project.

.5 Secure aluminum clips and fasteners to panel flanges with stainless steel fasteners utilizing pre-punched holes.

.6 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

2.3
Finish

.1 PVF2: Finish exposed surfaces of aluminum components with factory applied 70% polyvinylidene fluoride coating to match manufacturer’s standard colour and meeting performance requirements of AAMA 605.2, min. dry film thickness of 0.030mm.
.1 Colours:
.1 “White” to be Sobotec “Alabaster”.
.2 “Black” to be Sobotec “Focus Black”.
.3 “Network Grey” to be Sobotec “Cadet Gray”.
.4 “Web Gray to be Sobotec “Dusty Charcoal”.
.2 Gloss: matte brushed.
.3 Appearance: visibly free of flow lines, streaks, sags, blisters and other surface defects.

.2 Touch-up paint: as recommended by panel manufacturer.

2.4
Other Materials

.1 Sheet steel: exposed to exterior, commercial grade to ASTM A446-01 Grade A/B with Z275 zinc coating, to ASTM A-

653/A653M-06a.

.2 Aluminum Flashings and Trim: to standards of Section 08520, colour matched to panels, min. 2.0mm thick.

2.5
Other Components

.1 Furring Channels and Girts: Of min. 1.2mm base thickness steel, to ASTM A446, Grade A, with Z275 zinc coating, to ASTM A653/A653M profiles as indicated to accept exterior panel with structural attachment to building structure and/or exterior wall steel studs.
.1 Fabricate girts without cutting deformities.
.2 Fabricate components in accordance with reviewed shop drawings and to system manufacturer's recommendations.
.3 Drawings are schematic. Provide complete girt system incorporating "Z's", paired angles, channels and other profiles and components as required for a complete system.

2.6
Acceptable Systems

.1 Acceptable Systems: SL-2000 Dry-Joint Filler System by Sobotec Ltd. utilizing Alucobond composite aluminum panels with 13mm joints, or equivalent.

PART 3 - EXECUTION

3.1
Preparation

.1 Carefully examine construction and ensure arrangement, tolerances, materials and workmanship upon which the work of this section relies are in accordance with requirements of panel installer.

.2 Protect metal surfaces in contact with dissimilar metals, concrete, masonry mortar, plaster or other cementitious surface with isolation coating.

.3 Provide secondary steel framing for support of metal panel system where such framing is required, but not provided by structural steel or metal stud sections. Provide to CAN/CSA-S16.1-01 (R2007) and (CSA-S136-07.

3.2
Installation of
Panel System

.1 Install components so as to comply with design criteria.

Provide isolation shims to thermally separate carrying extrusions from steel studs, girts and structural framing.

.2 Layout units in accordance manufacturer's written instructions and with approved shop drawings.

.3 Maintain following installation tolerances:
.1 Maximum variation from plane or location shown on approved shop drawings: 10mm/10m of length and up to 20mm/100m. Maintain uniformity of joint size throughout installation.
.2 Maximum offset from true alignment between two abutting panels: 0.75mm.
.3 Maximum deviation for horizontal and vertical members: 3mm in 8.5m.

.4 Secure girts, sub-girts, Z-bars, angles, channels and other panel support system components to building frame, structural steel framing.

.5 Panel support system indicated on drawings is schematic. Do not regard as exact or complete.

.6 Provide alignment bars, brackets, clips, inserts, shims, as required to securely and permanently fasten wall and ceiling system to building structure. Brace ceiling system against wind uplift.

.7 Touch-up edges and surfaces where galvanized finishes have been cut, abraded, or otherwise interrupted.

.8 Install all flashings, peel and stick membranes and other water barriers vent tubes and vent holes as required to ensure positive drainage to the exterior of the panel system.

.9 Ensure continuity of pressure equalization of rain screen principle.

.10 Install aluminum panels and joint filler strips using concealed fasteners except for pop rivets on return edges.

.11 Install aluminum panels plumb, true and level and in proper alignment to established lines and elevations.

.12 Remove protective covering and labels from panels as they are erected.

.13 Apply required sealants and joint backing to all joints between panels and other construction materials except as otherwise specified. Apply sealants in accordance with Section 07910.

.1 Apply sealants when panel temperatures between 5° and 29°.
.2 Do not apply on a sunny day, except where wall will be in shade for the remainder of the day.

.14 Install panels so stresses on sealants are within sealant manufacturer's recommended limits.

.15 Clean and prime surfaces to be caulked as recommended by sealant manufacturer.

.16 Make all cutouts required for mechanical, electrical and other devices penetrating panels and suitably reinforce and seal.

.17 Where acceptable to Consultant, touch-up small chips, imperfections, blemishes or other defects.

.18 Replace damaged panels and components which cannot be satisfactorily repaired.

3.3
Cleaning

.1 Clean surfaces of all smears, dirt, grime, grease, stains, finger marks and other deleterious substances with cleaning materials and methods as recommended by panel manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Wood Cant Strips, Blocking, Curbs, and Nailing Strips: Section 06 10 00

.2 Air Barriers: Section 07 27 00

.3 Sheet Metal Flashings: Section 07 62 00

.4 Roof Drains: Division 22

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Quality Assurance

.1 The roofer shall be fully accredited as approved applicator by the manufacturer of the roofing membrane at the time of bidding and during the work. Accreditation shall be sufficient to provide material warranty specified.

.2 Use materials and accessory products recommended by membrane manufacturer.

.3 Do work to manufacturer's requirements for specified material and workmanship warranty.

.4 The roofer as well as any roofing Subcontractors at the time of bidding and during the work shall hold an operating license as a roofing contractor in the provincial jurisdiction where work shall take place.

.5 All materials shall be asbestos free.

1.4 Reference Standards

.1 Do roofing work in accordance with applicable standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual and Manufacturers Instructions except as otherwise specified.

.2 Do priming for asphalt roofing in accordance with CGSB 37-GP-15M (R1984).

.3 Do roofing work to conform with insulation manufacturer's recommendations.

.4 Do roofing work to FM I-60.

.5 Do modified bituminous roofing in accordance with manufacturer's instructions and CGSB 37-GP-56M + Amdt - Dec 85, including Appendix.

1.5
Roofing & Sheet Metal Inspection

.1 As per Section 01 45 00, a roofing and sheet metal inspector under authority of the Consultant will carry out continual inspection of this work. The roofing and sheet metal Subcontractor shall abide by his instructions. It will be the responsibility of this Subcontractor to notify the roofing inspector 48 hours prior to the commencement of any work. Inspection shall be paid from a cash allowance not included in this Section.

.2 Cut tests may be carried out to establish quality of work. Such tests will be carried out in the presence of the roofer. Roofer shall repair cut tests.

1.6
Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.
.1 Indicate sloped insulation layout.
.2 Prior to ordering materials submit detailed list of proposed materials and manufacturers along with technical data sheets for review.
.3 Submit modified bituminous membrane manufacturer's complete applicable installation instructions.
.4 Submit WHMIS MSDS. Indicate VOC content of primers, asphalts, sealers, adhesives.

1.7
Storage and Handling

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store rolls of felt and modified bituminous membranes in upright position.

.3 Remove only in quantities required for same day use.

.4 Use plywood runways to protect work during movement of material and other traffic.

.5 Store adhesives and caulking at +5°C minimum.

.6 Do not stockpile materials on roof. Distribute materials as directed by Consultant.

.7 Store insulation protected from sunlight and deleterious materials.

1.8
Identification and Delivery

.1 Indicate on containers or wrappings:
.1 Manufacturer's name and brand.
.2 Compliance with applicable standard.
.3 Mass where applicable.

.2 Deliver materials in original containers, sealed, with labels intact. Ensure that shelf life of materials has not expired.

.3 Deliver fasteners in boxes or kegs and keep in protective storage until used. Do not oil or grease fasteners.

1.9
Environmental Requirements

.1 Stop asphalt roofing work when temperature remains consistently below -5°C or when wind chill effect would set bitumen or adhesives before proper adhesion takes place. Stop torch application when temperature is below -15°C. Stop self-adhesive application when temperature is below +5°C.

.2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.10
Warranty

.1 The warranty period stated in GC12.3 - Warranty and relevant Supplementary Conditions is, with respect to this section of the work, extended from one year to two years.

.2 Provide a written guarantee in the form specified in Section 01 78 36. The CRCA and OIRCA forms of warranty are not acceptable.

.3 Warranty to cover roofing and related flashings and caulkings and to specifically guarantee against leakage and blow off.

.4 Provide modified bituminous membrane manufacturer's 10 year material warranty to guarantee against manufacturing defects.

1.11
Compatibility

.1 Compatibility between components of roofing system is essential. Provide written declaration to Consultant stating that materials and components as assembled in system, meet this requirement.

.2 Use modified bituminous membranes and accessory components of a single manufacture.

PART 2 - PRODUCTS

2.1
Bitumens

.1 Asphalt: to CSA A123.4-98, Type 3.

2.2
Membranes

.1 Modified Bituminous Membrane: Modified bituminous membrane to CGSB 37-GP-56M + Amdt-Dec 85, SBS modified, asphalt, reinforced and as follows; based on Soprema:
- .1 Base Sheet:
  - .1 Sopralene Flam 180, torched
  - .2 Base Flashing:
    - .1 Soprema, Sopraflash Flam Stick, self-adhered.
- .2 Exposed Cap Sheet and Cap Flashing.
  - .1 Soprema Sopralene Flam 250 GR.
- .3 Cap Sheet Colour: White/Light Grey.
- .4 Walkways: As Cap sheet but in contrasting colour. Colour: Black/Charcoal Grey.
- .5 Fireguard Tape: Sopraguard Tape, self adhered.

.2 Rubberized Asphalt, Self-Adhesive (peel & stick):
- .1 Lapping under roof membrane or membrane flashings; sand faced, 1.5mm thick. Acceptable products:
  - .1 Monsey-Bakor “Eaveguard”.
  - .2 Soprema “Elastobond”.
- .2 Other: to standards of Section 07 27 00.

.3 Vapour Retarder
.1 curbs and parapets : Soprema Sopraseal Stick 1100T
.2 Roof field : Soprema Elastophene 2.2.

2.3
Insulation

.1 Rigid Insulation: Polyisocyanurate to CAN/ULC S704-03 except as noted. Insulation shall be suitable for use in roofing systems specified.
.1 Compressive strength: Min. 20 psi to ASTM D1621.
.2 Flame Spread: Max. 25.
.3 Size: Max. 1.2m x 1.2m for setting in asphalt, max 1.2m x 2.4m for mechanical fastening.
.4 Thickness: Two equal layers totalling thickness indicated.
.5 Acceptable Manufacturers: IKO, Johns-Manville, Atlas.

.2 Protection board: To CAN/ULC-S706-02, Type II, max. 915 x 1220mm size, square edges, asphalt coated both sides, and impregnated min. compressive strength 45 psi. min. 6mm thick. Acceptable Manufacturers: Soprema Sopraboard or equivalent.

.3 Sloped insulation: isocyanurate insulation conforming to item 2 above, tapered shape to provide slope indicated but not less than 4% for crickets and in situ slope of min. 1½%. Stabndard of acceptance : E'NRG'Y3 by Johns Mansville, AC Foam II by Atlas.

2.4
Primers and Sealers

.1 Asphalt primer: to CGSB 37-GP-9Ma-88.

.2 Asphalt primer for self adhesive membranes: as recommended by membrane manufacturer.

.3 Plastic cement: asphalt, to CAN/CGSB 37.5-M89.

.4 Sealing compound: to CAN/CGSB 37.29-M89 SBS rubber asphalt type.

.5 Caulking compound: polyurethane to CAN2-19.13-M87, Type 2, Class "B".

.6 Polyethylene back-up rope: extruded closed cell foam Shore A hardness 20, tensile strength 140 to 20kPa, compatible with primers and sealants, oversized 30 to 50%.

2.5
Sheathing

.1 Gypsum Sheathing: glass mat faced, water resistant, non-combustible gypsum sheathing board 12.7 mm thick, factory primed. Acceptable Products: Georgia-Pacific Dens-Deck-Prime.

.2 Cement Board : glass fibre reinforced cement board, 12.7 mm thick, polystyrene free, Type X or non-combustible; CGC Durock exterior cement board, or approved equivalent.

2.6
Accessories

.1 Roofing nails: to CSA B111-1974 (R2003), Table 12. Ring threaded, 10mm head, of galvanized steel sufficient length to penetrate wood at least 25mm, barbed with 25mm solid caps.

.2 Stack Jack Flashings: 1.6mm spun aluminum sleeve with min. 100mm wide integral flange bituminous painted, with removable 1.6mm telescoping cap. Height min. 350 mm above roof membrane.

.3 Rigid Conduit & Piping Flashings: 1.6mm spun aluminum sleeve with min. 100mm wide integral flange, bituminous painted, with 1.4mm aluminum collar, both to include integral urethane insulation. Height, min. 350 mm above roof membrane.
.1 Plumbing Vents: Thaler SJ31 Stack Flashing c/w vandal proof cap.

.4 Mechanical Fasteners: FM approved system of rib stiffened, hot dip galvanized, 16ga. steel plates and special low profile head, zinc and dichromate plated, fully threaded screws: length to penetrate deck min. 20mm. As approved by roofing membrane manufacturer.

.5 Screws for fastening gypsum board to steel decks: #14 flat, countersink head tapering screws, Phillips, corrosion resistant yellow zinc plated or better, length to penetrate flute of deck by 20mm, to CSA B35.3.

.6 Joint Tape: asphalt treated kraft paper, fibre reinforced, 100mm wide, self adhesive.

.7 Zinc rich primer: to CAN/CGSB 1.181-1999.

.8 Flexible Conduit Flashing: Thaler; MEF-2A x size to suit.

.9 Mastic sealing compound for membranes, as recommended and supplied by membrane manufacturer.

PART 3 - EXECUTION

3.1
Fire Safety Torch on Membranes

.1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut off nozzle, ULC labelled for A, B and C class protection, size 9kg fire extinguisher, one unit on roof per torch applicator, within 6m of each torch applicator.

.2 Store propane bottle upright and secured. Locate min. 3m from torching location.

.3 Do not torch in area where flammable solvent remnants may be ignited.

.4 At end of each days' work check for smouldering fires. Maintain fire watch for min. 4 hours after cessation of torching operations. Fire watch personnel shall have appropriate equipment, including heat sensors, cutting tools, fire extinguisher and cellular telephone.

3.2
Protection

.1 Cover walls and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of work.

.3 Clean off drips and smears of bituminous material.

.4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.

.5 Remove and keep ponded water away from area of roof being worked on.

.6 Prevent traffic over completed roofing except where required by work above roof level comply with precautions as directed by Consultant. Repair damage caused by non-compliance with Consultant's requirements.

.7 At end of each day's work or when stoppage occurs due to inclement weather provide protection for completed work and materials out of storage.

.8 Temporarily block all down pipes while work is in progress.

.9 Conduct operations so as to leave deck exposed for minimum period of time. Protect as required, to prevent infiltration or environmental damage to building.

.10 All aspects of the roofing operation shall follow in close sequence. No part of the operation shall be so ahead of the succeeding part that the latter cannot be finished that working day.

3.3 Examination of Roof Decks

.1 Examine roof decks and immediately inform Consultant in writing of any defects.

.2 Prior to commencement of work ensure:
.1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
.2 Curbs have been built and vapour barriers installed beneath them.
.3 Roof drains have been installed at proper elevations relative to finished roof surface.
.4 Plywood and lumber nailer plates to walls and parapets have been installed as indicated.
.5 Items on or projecting through roof are solidly set.
.6 Materials are moisture free.
.7 Roof and parapet surfaces are properly sloped.

3.4 Workmanship

.1 Apply full size insulation and sheathing boards around perimeters and openings.

.2 Prevent seepage of bitumen to interior of building.

.3 No insulation to be left exposed at the end of a days work.

3.5 Priming

.1 Clean with solvent all metal in contact with bitumens such as flashings, caulking retainers and vents. Dry with clean rags.

.2 Use manufacturer’s recommended primer for self-adhesive flashings.

.3 Prevent pooling and seepage through joints. Allow to cure.

3.6
Preparation of Steel Deck

.1 Place deck sheathing with long axis of each sheet transverse to ribs, with end joints staggered and fully supported on ribs. Mechanically fasten to steel deck with specified fasteners spaced 400mm o.c. each way or at rate of 8 per board on full sized boards.

.2 Increase quantity of fasteners by 50% at roof perimeters and by 75% at roof corners. Extend additional fastener placement 2400mm minimum infield from perimeter parapets. Centre screws on ribs and secure. Ensure sheathing is pulled firm to steel dock at each screw.

3.7
Application of Modified Bituminous Membranes
- General

.1 Apply 2 ply modified bitumen roofing and flashings and 1 ply vapour retarder in accordance with manufacturer's instructions and as further noted.

.1 Do not cut materials over installed roof surfaces.

.2 Dry fit and size all flashings prior to installation.

.3 Unroll and align membrane min. half length and align prior to rerolling and installing.

.4 Stagger adjacent end laps min. 2m. Lap sides and ends as recommended by manufacturer.

.5 Adhere to ensure a positive bond without voids.

.6 Using a propane torch, direct flame to underside of roll and melt both surfaces simultaneously. Ensure polypropylene film is fully melted. Avoid overheating or under heating membranes. Fully torch in place sheet membrane using proper application techniques as specified by membrane manufacturer. During application, unroll membranes slowly into fluid bitumen, ensuring consistent 3mm to 6mm flow protrudes each side of roll.

.7 Install membranes with side and end laps as recommended by manufacturer. Cut off corner piece of selvage edge at end lap that will be covered by the next roll.

.8 Extend flashings onto roof surface as recommended by Manufacturer.

.9 Embed granules prior to installation of following sheets.

3.8
Application of 1-Ply Modified Bituminous Vapour Retarder
Over Gypsum Board

.1 Start at the low point of the roof and normally at right angles to the slope.

.2 Carry vapour retarder up abutting surfaces to 100mm above top of insulation. At penetrations, including roof drains, conduits, pipes, vents and scuppers, create air vapour barrier seal by lapping self-adhesive vapour retarder membrane 100mm onto penetration and sealing with membrane sealing compound.

.3 Torch weld vapour retarder to sheathing.

3.9
Application of Insulation

.1 Over steel deck:
.1 Place first layer of insulation with long axis of each sheet transverse to ribs with end joints staggered and fully supported on ribs. Secure insulation with adhesive in pattern as per manufacturers recommendations.

.2 Set boards in moderate contact with each other and stagger joints. Cut, fit neatly, and mitre as required to prevent open joints or irregular surfaces.

.3 Pack all gaps between boards wider than 2mm with approved insulation.

.4 Apply successive layers of insulation in broken joint construction so that each layer breaks joint both ways with the preceding layer.

.5 Where necessary back-cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging. Subsequent to placement, walk insulation into place to ensure positive bonding is achieved.

.6 Do not lay more insulation than can be covered with membrane roofing on the same day. Promptly remove from site insulation which is damaged by moisture.

3.10
Application of Protection board and Sloped Insulation

.1 Install protection board and sloped insulation with adhesive, in pattern as per manufacturers recommendations.

.2 Cut, fit neatly and mitre as required to prevent open joints or irregular surfaces.

.3 Where necessary, back cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging.

.4 Walk insulation and protection board into place to ensure positive bonding as achieved.

.5 Butt boards together without gaps.

.6 Pack all gaps between fibre board and sloped insulation boards wider than 2mm with approved insulation.

.7 Apply self-adhered fire-guard tape over all protection board joints as required.

3.11
Application of Modified Bituminous Roof Membrane and Membrane Flashings

.1 Membranes indicated on drawings are schematic, do not regard as exact or complete.

.2 Base Sheet:
.1 Starting at a low point of the roof and normally at right angles to the slope, torch on base sheet.
.2 Terminate all base ply sheets min. 100mm above roof surface and min. 50mm above top of cant.
.3 Lap base sheet at drain.

.3 Base Flashing:
.1 Use self-adhesive base flashing.
.2 Cut base sheet flashing from base sheet roll giving pieces 1m wide by a length that will run sufficiently onto roof at the base of curb or parapet and will extend to the height of the top of the parapet. If parapet is less than 200mm high above top of insulation, extend base sheet flashing over parapet, down fascia, and secure; as specified for cap sheet flashing.
.3 For self-adhesive application:
.1 Allow primer to dry before installing self-adhesive membranes.

.2 Remove plastic film on the section of membranes to be covered by self-adhesive base flashing. Provide primer over sanded membranes to be covered.
.3 Press into place to ensure full adhesion and roll smooth.
.4 Install reinforcing gusset in all inside and outside corners.

.4 Cap Sheet:
.1 Starting at a low point, in the same direction as base sheet, staggering half full width from side lap of base sheet, install cap sheet.
.2 Terminate membrane cap sheets flush with base of cant strip.
.3 Torch on cap sheet.

.5 Cap Sheet Flashing:
.1 Cut cap sheet flashing from cap sheet roll, cutting pieces 1m wide by a length that will run sufficiently onto roof at the base of curb or parapet and will extend over the parapet and down outside wall surface, or to point immediately below where metal counterflashing enters wall.
.2 Starting above the roof cap sheet, melt both surfaces to be bonded and press (using wet cloth) into position until pieces are fully adhered.
.3 Fasten top and outside edges of cap sheet at 200mm o.c. through flat discs. Ensure end laps are staggered from cap sheet membrane side laps.
.4 Torch on cap flashing.
.5 Extend cap flashing min. 100mm further onto roof surface than base flashing (300mm at tie-in to existing roofs).

.6 As each layer of membrane is installed, inspect entire area, ensure no wrinkles, buckles, air pockets, or fishmouths exist and that every lap is fully adhered. Correct any such defects as directed by Consultant.

.7 At field built curbs extend membrane flashing up outside face of curbs and over top to inside face of curb. At steel curbs extend flashing to top of curbs.

.8 At vertical terminations, seal leading edge of membranes with sealing compound.

.9 On interior walls, build base flashing up to cavity wall through-wall flashing.

.10 Keep nails min. 250mm above top of roof surface.

.11 Membrane flash vents, drains, gravel stops and projections in modified bituminous roofing as recommended by modified bituminous membrane manufacturer.

.12 Extend membrane flashing continuously over area dividers and sleepers.

.13 Paint exposed polystyrene insulation with two coats of latex paint.

3.12
Flashing Vent Stacks, Conduits Pipes

.1 Provide vapour seal and thermal continuity at vent stack, conduit and pipe penetrations.
.1 At 'B' vents, metal chimneys and generator exhaust pipes use bitumen cup sleeve with high temperature sealant and rock wool insulation to vapour seal and insulate respectively.

.2 Elsewhere, use expanding foam insulating between penetration and edge of roof insulation for full depth of roof insulation.

.2 Flash with sleeves with 100mm wide flanges set on top of base ply.

.3 Seal edge of base ply to stack or pipe with mastic sealant.

.4 Embed vent stack flashing flange into torch softened base ply.

.5 Provide additional reinforcing of one metre square of base sheet installed diagonnally torched on around sleeve and cut to fit.

.6 Insulate annular space inside sleeve:
.1 At "B" vents, metal chimneys and generator exhaust pipes use rock wool insulation.
.2 Elsewhere use expanding foam insulation.

.7 Install telescoping caps on soil pipes sealed solid with caulking to prevent condensate traps.

.8 Install rain collars at sleeves of matching material. Clamp and caulk to shed water.

.9 Bituminous caulk base of sleeve riser. Cover with granules matching cap sheet.

.10 Coordinate work with Division 22 and 26.

3.13
Openings

.1 Provide membrane flashings to all equipment on roof and where any material passes through roof. Refer to all drawings to determine extent of cooperative work.

.2 Do not use pitch pockets. Provide premanufactured flashings as specified, shown, or otherwise approved by Consultant.

3.14
Flashing Roof Drains

.1 Slope insulation thickness down to 38mm at drain from 1200mm beyond each side of drain.

.2 Set roof drains to permit proper drainage and not retard water flow after completion of flashing plies. Coordinate with Division 22.

.3 Secure roof drains to deck and to drain pipe.

.4 Embed flashing flange into 3mm thickness of sealing compound on top of roofing felts.

.5 Provide additional reinforcing of one metre square of base sheet reinforcing installed diagonally torched on around roof drains and cut to fit.

3.15
Debris

.1 The roofing contractor shall remove all debris from the roof and ground, formed by his forces and remove same to an authorized dump, leaving the working area in a clean and satisfactory manner.

3.16
Tie-Ins

.1 Ensure tie-ins of roof vapour barrier and of roof insulation to vapour barrier and to insulation in adjoining construction, both existing and new, including walls, parapets and roofs. Extend and connect vapour barrier and insulation as required for continuity of moisture and thermal protection.

.2 Provide 600mm tie-in of new roofing over existing bituminous roofing which is to remain.
.1 For modified bituminous roofing, torch cap sheet and embed all granules.

.3 Torch on new 2-ply modified bituminous flashing; base lapping min. 300mm over mod. bit. over existing roofing and cap lapping a further min. 300mm.

.4 Reinstate gravel on built-up roofing. Heat modified bituminous membrane where granules have been embedded and cover with granules to stick onto heated membrane.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Wood cant strips, blocking, curbs and nailing strips: Section 06 10 00

.2 Roofing: Section 07 52 00

.3 Aluminum flashing associated with aluminum windows: Section 08 51 00

.4 Flashing associated with composite aluminum Panel system: Section 07 42 42

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
References

.1 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B32-87 Specification for Solder Metal.

.3 CRCA Specifications Manual, 1997.

.4 CSA B111-1974 Wire Nails, Spikes and Staples.

.5 CAN/CGSB 37.5-M89 Cement, Plastic, Cutback, Asphalt.

.6 CSSBI Bulletin No. 7 - October 1979; Canadian Sheet Steel Building Institute, Publication No. 40-7-79.

1.4
Samples

.1 Submit 50 x 50mm samples of sheet metal material colours and finishes. Submit in accordance with Section 01 30 00.

PART 2 - PRODUCTS

2.1
Metal Flashing

.1 Prefinished: 0.61mm (24ga)] galvanized thickness, commercial quality sheet steel to ASTM A653/A653M with Z275 zinc coating. Factory precoat with 8000 Series two coat modified silicone finish, conforming to CSSB1 Bulletin No. 7, with dry film thickness of 0.025mm on exposed surfaces. Colour “Charcoal”, unless otherwise noted.

.2 Galvanized: Commercial quality sheet steel to ASTM A653/A653M with Z275 zinc coating.

2.2
Accessories

.1 Isolation coating: Alkali resistant bituminous paint.

.2 Sealants: Provide to requirements of Section 07 92 00.

.3 Cleats: Of same material and temper as sheet material, min. 50mm wide. Thickness twice that of sheet metal being secured.

.4 Fasteners: Of same material as sheet metal, to CSA B111 ring threaded flat head roofing nails, of length and thickness suitable for application. Provide min. 20mm penetration into wood.

.5 Touch-Up Paint: As recommended by flashing and trim manufacturer.

.6 Solder: To ASTM B32, 50% tin, 50% lead.

.7 Flux: Rosin, cut by hydrochloric acid, or commercial preparation suitable for materials to be soldered.

2.3
Fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA "FL" series specifications and Factory Mutual I-49 except as otherwise indicated. Use pre-finished sheet metal except as otherwise noted.

.2 Form pieces in 2400mm maximum lengths. Make allowance for expansion at joints.

.3 Hem exposed edges on underside 12mm. Mitre corners.

.4 Form sections square, true, and accurate to size, free from distortion and other defects detrimental to appearance and performance.

.5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar or to be in contact with dissimilar metals.

.6 Form flashing to maintain min. 5% slope unless otherwise noted.

.7 Provide folded end dams at metal flashing terminations.

.8 Flashing down legs to cover cladding min. 50mm unless otherwise noted.

2.4
Sheet Metal Scupper Sleeves, Air Barriers & Fire Stops

.1 Fabricate sheet metal scupper sleeves, air barriers and fire stops of galvanized metal flashing. Thickness; scupper sleeves min. 0.85mm (22ga), elsewhere min. 0.55mm (26ga.) except as otherwise indicated.

.2 Apply alkali resistant bituminous paint isolation coating to isolate sheet metal from dissimilar metal or aluminum and concrete.

2.5
Scuppers

.1 Form scuppers from 0.85mm thick galvanized steel sheet metal. Fabricate as continuous unit with no open joints or corners. Solder joints and corners.

PART 3 - EXECUTION

3.1
Installation

.1 Install sheet metal work in accordance with CRCA specification and as detailed. Provide watertight installation.

.2 Use concealed fasteners except where approved before installation. At exposed locations use weathertight, stainless steel fasteners. Locate evenly and neatly.

.3 Secure metal flashings by nailing at lock joints and at top edge of flashings. Secure flashing at max. 300mm c to c. Do not fasten metal into cant. (Where cap flashing is required, install underlay sheet so that inside crimped edge covers nails in counter flashings).

.4 Counter flash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, yet allowing for thermal movement.

.5 At corner joints and where joint sealant is exposed, seal joints with polyurethane sealant.

.6 At lap joints, seal joint with non-skinning butyl concealed from view.

.7 Lock end joints.

.8 Install surface mounted reglets true and level, and caulk top of reglet with exterior sealant and rope. Slope sealant to drain.

.9 Turn top edge of flashing into recessed reglet or mortar joint, min 25mm. Lead wedge flashing securely into a reglet at max. 610mm o.c. Caulk reglet at flashing with sealant as per Section 07 92 00.

.10 Do not form open joints, pockets, or surfaces that fail to drain water. Install flashing to maintain min. 5% slope except as otherwise noted.

.11 Finished surfaces shall be free from buckling, warp, wave, dents, oil canning or other defects. Make corners square and surfaces straight and in true planes.

.12 Equally space joints in any one run of flashing to suit building module. Obtain Consultant's approval of joint locations before installation.

3.2
Air Barriers

.1 Seal joints in galvanized metal air barrier closures with 150mm wide strip of rubberized asphalt; peel and stick membrane to standards of Section 07 25 00.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Sheet Metal Firestops: Section 07 62 00

.2 Fire Dampers: Division 23

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Scope of Work

.1 Do all firestopping except as specified under other sections.

1.4 References

.1 CAN/ULC-S102-03, Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN4-S115-05, Fire Tests of Firestop Systems.

1.5 Shop Drawings

.1 Submit shop drawing and product data in accordance with Section 01 30 00.

.2 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

.3 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

PART 2 - PRODUCTS

2.1 Materials

.1 Firestopping and Smoke Seal Systems: in accordance with CAN4-S115.
.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and

not to exceed opening sizes for which they are intended and conforming to special requirements specified in 3.5.
.2 Firestop system ratings: equal to abutting assembly, Type “F”.
.3 In return air plenums: flame spread max. 25 and smoke developed max. 50 to CAN/ULC-S102.

.2 Service penetration assemblies: certified by ULC in accordance with CAN4-S115 and listed in ULC Guide No. 40U19.

.3 Service penetration firestop components: certified by ULC in accordance with CAN4-S115 and listed in ULC Guide No. 40 U19.13 and ULC Guide NO. 40 U19.15 under the Label Service of ULC.

.4 Fire resistance rating of installed firestopping assembly not less than the fire resistance rating of surrounding floor and wall assembly.

.5 Firestopping at openings intended for ease of re-entering such as cables: elastomeric seal.

.6 Firestopping and smoke seal at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.10 Sealants for vertical joints: non-sagging.

PART 3 - EXECUTION

3.1
Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that

substrates and surfaces are dry and frost free.

.2 Prepare surfaces in contact with firestopping materials and smoke seal to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2
Installation

.1 Install firestopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.2 Seal holes or voids made by penetrations, poke-through termination devices, and unpenetrated openings or joints and gaps in construction continuity to ensure continuity and integrity of fire separations are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to a neat finish.

.5 Remove excess compound promptly as work progresses and upon completion.

3.3
Inspection

.1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4
Schedule

.1 Firestop and smoke seal at:
.1 Penetrations through fire resistance rated masonry, gypsum board partitions, ceilings and walls.
.2 Top of fire resistance rated masonry, gypsum board partitions, and walls.
.3 Intersection of fire resistant rated gypsum board partitions with masonry and concrete.
.4 Penetrations through fire resistant rated gypsum board

ceilings.

.5 Control joints in fire resistant rated masonry walls, gypsum board walls and ceilings.
.6 Openings and sleeves installed for future use through fire separation.
.7 Around mechanical and electrical assemblies penetrating existing floors, ceilings, corridor walls, service room walls, and other fire rated separations.
separations including new in new, new in old, old in new.

.2 Smokeseal at locations in item 3.4.1 which are unrated fire separations where abutting materials cannot be tightly fitted.

3.5
Special Requirements

.1 Location of special requirements for firestopping materials at openings and penetrations in fire resistant rated assemblies are as follows:
.1 Movement: 10% at intersection of dissimilar construction assemblies.
.2 Designed for reentry: at openings for data, phone and TV cables of walls, of electrical rooms, computer rooms, and server rooms.
.3 Designed for sound and vibration control: mechanical rooms and music rooms.

3.6
Clean-Up

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of firestopping materials.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

.1 This Section specifies caulking and sealants not specified in other Sections.

.2 Refer to other sections for other caulking and sealants, including:

.1 Counter Splashback Caulking:	Section 06 20 00
.2 Firestopping:	Section 07 84 00
.3 Composite Aluminum Cladding:	Section 07 46 19
.4 Roof Flashing:	Section 07 62 00
.5 Aluminum Windows/Curtain Wall:	Section 08 51 00
.6 Glazing:	Section 08 80 00
.7 Acoustic Caulking:	Section 09 21 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 References

.1 Canadian General Standards Board (CGSB):
.1 CAN/CGSB 19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.
.2 CGSB 19-GP-14M-1984 Sealing Compound, One Component, Butyl-polyisobutylene Polymer Base, Solvent Curing.
.3 CAN/CGSB 19.17-M90 Sealing Compound, One Component, Acrylic Emulsion Base, Sealing Compound.
.4 CAN/CGSB 19.22-M90 Mildew Resistant, Sealing Compound for Tubs and Tile.
.5 CAN/CGSB 19.24-M90, Multi-component, Chemical Curing, Sealing Compound.

1.4 Samples

.1 Submit duplicate colour samples of each type of material in accordance with Section 01 30 00.

.2 Submit MSDS for proposed sealants and primers. Indicate VOC content.

1.5
Delivery, Storage and Handling

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, in tact. Protect from freezing, moisture and water.

1.6
Warranty

.1 The warranty period stated in GC-12.3; Warranty and relevant Supplementary Conditions, is with respect to this section of work extended from one year to three years. Provide a written guarantee in the form specified in Section 01 78 36.

.2 Warranty shall specifically guarantee against leakage, running, loss of adhesion, or staining adjacent surfaces.

PART 2 - PRODUCTS

2.1
Sealant Materials

.1 Exterior sealant, and interior expansion and control joint sealant: Multi-component polyurethane to CAN/CGSB-19.24, Type 2, Class "B". Acceptable products: Tremco "Dymeric 240", max. VOC 50g/l.

.2 Other interior joint sealant (excluding expansion joints and masonry control joints): Latex to CAN/CGSB-19.17, multi component, thermoplastic elastomeric, solvent curing. Acceptable products: Tremco “834" siliconized acrylic latex. max. VOC 15g/l.

.3 Roof flashing sealant:
.1 Exposed: One component polyurethane, to CAN/CGSB-19.13, Type 2 Class "B", colour to match metal work. Acceptable products: Tremco "Dymonic".
.2 Concealed: Non-skinning butyl to CGSB 19-GP-14M.

.4 Silicone sealant: Mildew resistant, to CAN/CGSB-19.22, clear. max. VOC 250g/l.

.5 Threshold sealant: Butyl to CGSB 19-GP-14M. max. VOC 250g/l.

.6 Non-moving joint filler: Latex to CAN/CGSB 19.17.max. VOC

15g/l.

.7 Horizontal joint sealant: Two component, self-levelling polyurethane, to CAN/CGSB-19.24, Type 1, Class B. max. VOC 50g/l.

.8 Sawcut joint filler: "Load-flex" by Sternson. max. VOC 250g/l.

.9 All materials shall be asbestos free.

2.2
Back-up Materials

.1 Joint fillers:
.1 General: Compatible with primers and sealants, outsized 25 to 40%.
.2 Extruded Foam rod: Polyolefin, 32kg/m^3, closed cell surfaced, non-gassing when punctured, dust free and not able to absorb water. Acceptable products: Tremco “Sof-Rod”.

.2 Bond Breaker Tape: Polyethylene tape, which will not bond to sealant.

2.3
Joint Cleaner

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primers: As recommended by sealant manufacturer. Max. VOC content:
.1 Porous surfaces: 775g/l
.2 Non porous surfaces: 250g/l.

PART 3 - EXECUTION

3.1
Preparation

.1 Examine joint sizes to establish and correct depth to width relationship for installation of back-up materials and sealants.

.2 Clean bonding joint surfaces of harmful substances including dust, rust, oil, grease, paint, loose mortar and other matter which may impair work.

.3 Do not apply sealants to joint surfaces treated with sealer,

curing compound, water repellant, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with sealant manufacturer's instructions.

3.2
Priming

.1 Where necessary to prevent staining, mask adjacent surfaces with tape prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant to manufacturer's instructions immediately prior to caulking.

3.3
Back-up Material

.1 Apply bond breaker tape, where required to manufacturer's instruction.

.2 Install joint filler to achieve correct joint depth and shape.

3.4
Mixing

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.5
Workmanship

.1 Sealant:
.1 Apply sealants, in accordance with manufacturer's instructions.
.2 Mask edges of joint where irregular surface or sensitive joint border exists, to provide neat joint.
.3 Apply sealant in continuous beads.
.4 Apply sealant using a gun with proper size nozzle.
.5 Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
.7 Tool exposed surfaces to give a slight concave joint.
.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.
.2 Do not cover up sealants until proper curing has taken place.

.3 Clean-up:
.1 Clean adjacent surfaces immediately and leave work neat and clean.
.2 Remove excess and droppings, using recommended cleaners as work progresses.
.3 Remove masking tape after tooling of joints.

3.6
Application

.1 Apply sealant to make the building weather and air tight as indicated typically on drawings and as otherwise specified.

.2 Apply exterior sealant around exterior perimeter of every external wall opening and penetration.

.3 Apply interior sealant around interior perimeter of every external wall opening and penetration.

.4 Apply interior sealant at perimeters of non-wrap around interior door frames, both sides.

.5 Apply expansion joint sealant to expansion and control joints.

.6 Apply fine bead of silicone sealant around plumbing fixtures at walls.

.7 Set door thresholds in two continuous beads of butyl sealant.

.8 Where directed apply fine bead of latex sealant to non-moving exposed interior joints to be painted.

.9 Caulk saw cuts in and perimeter joints of slab-on-grade.

.10 Apply horizontal joint sealant to horizontal wearing surface control joints.

.11 Apply sealant to all other locations where caulking is required and not specified under other sections.

END OF SECTION

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NOTES

1. All doors 45mm thick u/n.

2. All frames 50mm wide u/n.

3. Glaze doors, side lights and pressed steel window frames as follows:
   - all glass min. 6mm thick
   - in fire separations ⅓hr and greater: Georgian wired glass
   - in exterior side lights and transoms: sealed insulated units, tempered glass to 2150ht u/n.
   - exterior doors without vestibules: sealed insulated units, tempered glass, clear glass
   - elsewhere: tempered glass to 2150 ht. u/n

4. Under cut doors max. 20mm (noted as u/c in Schedule).

5. See electrical drawings for locations of door frames requiring cutouts for security system contacts.

PYE & RICHARDS ARCHITECTS INC.

DOOR, FRAME & HARDWARE SCHEDULE

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Door No.	Key Side	Location	Door Type	Door Dimension	Fire Rating	Frame Type	Hardware	Frame Details	Remarks
D100	EXT	101	AL-1	950 X 2150	-	F3	1B	F, I, J	
D101	101	102	AL-2	950 X 2150	-	F4	2B	H, R, S, W	
D102	132	102	SG	7000 X 2400	-	-	7	-	sliding grille
D103	103	134	SC-2	950 X 2150	-	F10	3	V	
D104	132	104	SC-1	950 X 2150	-	F10	9	V	
D105	132	105	SC-1	950 X 2150	-	F10	9	V	
D106	132	106	SC-1	950 X 2150	-	F10	5	V	
D107	132	107	SC-1	950 X 2150	-	F10	10	V	
D108	103	108	AL-2	950 X 2150	-	F2	3	E	
D109	108	109	AL-2	950 X 2150	-	F2	4	E	
D110	132	110	AL-2	950 X 2150	-	F2	4	E	
D111	132	111	AL-2	950 X 2150	-	F5	4	E	
D112A	112A	Closet	SC1	2-900 X 2150	-	F11	8		
D115	108	124	HM-2	950 X 2150	-	F10	3	Z	
D116	134	116	SC-2	950 X 2150	-	F14	4	A, C, D, E	
D118	132	118	AL2	950 X 2150	-	F2	4	A, B, D, E	
D119	120	132	AL2	950 X 2150	-	F6	2A	G, H, K, S, U, W	
D120	EXT	120	AL1	950 X 2150	-	F7	1A	F, I, J, T	
D122	132	122	AL-2	950 X 2150	-	F1	4	E	
D123	132	123	AL-2	950 X 2150	-	F1	4	E	

D124	132	124	AL-2	950 X 2150	-	F1	4	E	
D125	132	125	AL-2	950 X 2150	-	F1	4	E	
Door No.	**Key Side**	**Location**	**Door Type**	**Door Dimension**	**Fire Rating**	**Frame Type**	**Hardware**	**Frame Details**	**Remarks**
D126	132	126	AL-2	950 X 2150	-	F1	4	E	
D127	EXT	127	AL-1	950 X 2150	-	F8	1B	F, I, J, T	
D128	132	128	AL-2	950 X 2150	-	F1	4	E	
D129	132	129	AL-2	950 X 2150	-	F1	4	E	
D130	132	130	AL-2	950 X 2150	-	F1	4	E	
D131	132	130	AL-2	950 X 2150	-	F1	4	E	
D132	127	132	AL-2	950 X 2150	-	F9	2B	A, B, C, D, E	
D133	133	103	HM-2	950 X 2150	-	F10	3	V	
D133A	133	102	RS	2440 X 2150	-	-	-	-	rolling shutter
D137	EXT	137	HM-1	915 X 2150	-	F15	6	X	insulated door
D137A	EXT	137A	HM-1	2 - 900 X 2150	-	F15	13	X	insulated doors
D138	136	138	HM-1	2-910 x 2150	-	F11	11	V	
D141	EXT	141	HM-1	950 X 2150	-	F10	6	X	insulated door
D141B	140	MEZZ	HM-1	950 X 2150	-	F15	14	V	insulated door
D208A	208	208A	AL-2	950 X 2150	-	F12	4	A, B, D, E	
D208B	208	208B	AL-2	950 X 2150	-	F13	4	A, B, D, E	
D215	EXT	141	OH-1	4800 X 4200	-	F16	12	v	
OH1	EXT	141	OH-1	4800 X 4200	-	F16		(see plan detail)	insulated, with vision panels

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OH2	EXT	137	OH-2	2440 X 2400	-	F16		Y	insulated

PART 1 - GENERAL

1.1
Related Work

.1	Building-in Frames:	Sections 04 20 00, 06 10 00 and 09 21 00
.2	Installation of Doors:	Section 06 20 00
.3	Door Hardware:	Section 08 71 00
.4	Glazing:	Section 08 80 00
.5	Painting:	Section 09 91 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
References

.1 American Society for Testing and Materials (ASTM International):
.1 ASTM A568/A586M-04 Standard Specification for Steel, Sheet Carbon, and High Strength Low-Alloy, Hot Rolled and Cold Rolled General Requirements for.
.2 ASTM A653/A653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
.3 ASTM A 167-99 (R2004) Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strips.

.2 Canadian General Standards Board (CGSB):
.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International):
.1 CAN/CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.2 CSA G164-M92(R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 Canadian Steel Door Manufacturers' Association (CSDMA):
.1 CSDMA, Specification for Commercial Steel Doors and Frames 1990.
.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors 1990.

.5 National Fire Protection Association (NFPA):
.1 NFPA 80-99, Standard for Fire Doors and Fire Windows.

.6 Underwriters' Laboratories of Canada (ULC):
.1 CAN4-S104-80(R1985), Fire Tests of Door Assemblies.
.2 CAN4-S105-85(R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.8 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.4
Requirements

.1 Steel fire-rated doors and frames: Listed, labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4 S104M and CAN4 S105M for ratings specified or indicated.

.2 Install labelled steel fire-rated doors and frames to NFPA 80-99 except where specified otherwise.

1.5
Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Indicate each type of door and frame material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners and anchors, openings, arrangement of hardware, fire rating and finishes.

.3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.

PART 2 - PRODUCTS

2.1
Materials: General

.1 Galvanized sheet steel: Commercial quality to ASTM A568M zinc coated to ASTM A653M with coating designation ZF075 (wiped).

.2 Hardware reinforcement: Galvanized sheet steel min. 3.5mm base thickness.

.3 Glazing stops and channels: Galvanized sheet steel min. 1.2mm base thickness.

.4 Fire rated construction: As indicated and in accordance with listing requirements. Provide ULC or WHI labels.

.5 Primer: For touch-up, zinc rich, organic to CAN/CGSB 1.181.

.6 Glazing stop screws: Chromium plated.

.7 Reinforcement Channels: To CAN/CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M; ZF075.

.8 Expanded polystyrene: CAN/ULC-S701, Type 3, density 16 to 32 kg/m^3.

.9 Polyurethane: to CAN/ULC-S704 rigid, modified poly / isocyanurate, closed cell board. Density 32 kg/m^3.

.10 Adhesives:
.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.2
Materials: Doors

.1 Faces: Galvanized sheet steel, min. 1.2mm base thickness exterior min. 1.52mm base thickness, acoustic min. 1.52mm base thickness.

.2 Door Cores:
.1 Honeycomb: structural core consisting of resin impregnated kraft paper, having 20mm cell size to

thickness indicated.

.2 Steel Stiffened: hollow steel vertically stiffened with steel ribs at max. 300mm o.c., and with all voids filled with min. 24kg./m³ density semi-rigid glass fibre insulation.

.3 Insulated: bonded core of expanded polystyrene or isocyanurate insulation board.

.3 Door Core Schedule:

.1 Exterior:Insulated.

.2 Other:Honeycomb.

2.3

Materials: Frames

.1 Frames: Galvanized sheet steel min. 1.6mm base thickness, welded.

.2 Floor anchors, channel spreaders, and wall anchors: Galvanized sheet steel min. 1.5mm base thickness.

.3 Guard boxes: Galvanized sheet steel min. 0.76mm base thickness.

.4 Reinforcing channel: To CAN/CSA G40.21, type 300W hot dip galvanized with minimum zinc coating to CSA G164 of 380 gm/sq.m.

.5 Door bumpers: Black neoprene.

.6 Clip angles: min. 3.0mm base thickness (11ga.) Z275 galvanized sheet steel.

2.4

Fabrication: General

.1 Fabricate steel doors and frames as detailed to Canadian Steel Door and Frames Manufacturer's Association (CSDFMA) "Canadian Manufacturing Specifications for Steel Doors and Frames" (1990) except where specified otherwise. Fabricate fire doors and frame in accordance with labelling organization requirements.

.2 Blank, reinforce, drill and tap doors and frames for mortised hardware and for wiring. Reinforce doors and frames for surface mounted hardware.

.3 Repair any surface depressions, butted joints, and tube and screw anchor points with metallic paste filler. Sand to

uniform smooth finish.

.4 Apply, at factory, touch-up primer to doors and frames where galvanized coating has been damaged during fabrication.

.5 Attach fire-rating labels to doors and frames. Attach temperature rise labels to doors and frames in firewalls

.6 Fabricate glazed lights and interior screens with non-removable stops on security side except as otherwise indicated.

.7 Secure glazing stops 50mm from ends and max. 200mm o.c. and min. two screws per stop.

.8 Fabricate glazing stops, glazing channels and other components free of sharp corners and edges and fit tightly to adjacent components.

2.5
Door Fabrication

.1 Mechanically interlock and tack weld longitudinal edges with min. 12mm welds at max. 300mm o.c.

.2 Make provisions for louvres and glazing as indicated and provide necessary glazing stops.

.3 Construct rail and stile doors in same manner as flush doors.

.4 Construct matching panels in same manner as doors.

.5 Ensure bottoms will clear floor finish but do not exceed ULC standards.

.6 Provide flush plastic cap insert for top of exterior doors.

.7 Fabricate astragals of min. 4.8mm base thickness galvanized sheet steel, and weld in place. Provide in accordance with labelling organization requirements. Do not provide astragal for pairs of fire rated doors 2184mm high or less in height and under 3 hour rating unless noted otherwise.

2.6
Frame Fabrication

.1 Cut mitres and joints accurately and weld continuously on inside of frame profile.

.2 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.

.3 Provide jamb anchors for fixing at floor. Provide jamb anchors in both jambs, immediately adjacent to hinge levels, to anchor frame to wall construction.

.4 Install three bumpers on strike jamb for each single door and two bumpers at head for pairs of doors.

.5 Make provision for glazing as indicated and provide necessary glazing stops.

.6 Protect strike and hinge reinforcement using guard boxes welded to frame in masonry and fire rated frames.

.7 Reinforce head of frames wider than 1.2m with reinforcing channel.

.8 Reinforce jambs with 75 x 35mm galvanized structural steel channel at door jambs abutting screens and in screen mullions at max. 2.0m o.c. Install reinforcing continuous from floor to structure above and laterally secure. Allow for structural deflection.

.9 Provide integral drip flashing across head of exterior frames.

PART 3 - EXECUTION

3.1
Installation General

.1 Install fire rated doors in accordance with National Fire Codes, Volume 4, produced by National Fire Protection Association (NFPA) 80.

3.2
Door Installation

.1 Install doors and hardware in accordance with hardware templates and Manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
.1 Hinge side: 1.0mm.
.2 Latchside and head 1.5mm.

.3 Between bottom and non-combustible substrate: max. 19mm.
.4 Between bottom and finished floor: 13mm.

.3 Adjust operable parts for correct function and optimum efficiency.

3.3
Frame Installation

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door openings to maintain frame width. Provide vertical support at centre of head for openings over 1.2m wide. Remove temporary spreaders after frames are built in.

.4 Make allowance for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Anchor reinforcing in door jambs of screens and in screens, to structure above and below.

3.4
Finish Repairs

.1 Touch up with primer, galvanized finish damaged during installation.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1	Installation of Doors:	Section 06 20 00
.2	Wood Door Frames:	Section 06 20 00
.3	Steel Frames:	Section 08 11 00
.4	Door Hardware:	Section 08 71 00
.5	Glazing:	Section 08 80 00
.6	Painting:	Section 09 91 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 References

.1 CSA 0115-M1982 Hardwood and Decorative Plywood.

.2 CAN/CSA O132.2 Series-90 (R2003) Wood Flush Doors.

.3 Architectural Woodwork Standards, Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturers Association of Canada (AWMAC) / Woodwork Institute (WI), 1st Edition, 2009.

1.4 Samples

.1 Submit samples in accordance with Section 01 30 00.

.2 Submit one 300 x 300mm corner sample of each type wood door.

.3 Show door construction, core, glazing detail and faces.

1.5 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Indicate door types, stop details, cutouts for lights and louvres.

1.6 Regulatory Requirements

.1 Fire-resistance rated for wood doors: Certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.7 Protection

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.

.2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.

.3 Protect doors from scratches, handling marks and other damage.

1.8 Warranties

.1 Provide manufacturer's three year warranty covering warpage, twist, showing core lines, splitting, delaminating, and sag.

.2 The warranty period stated in GC-12.3 Warranty and relevant Supplementary Conditions, is, with respect to this section of work, extended from one year to three. Provide a written guarantee in the form specified in Section 01 78 36.

.3 Warranty shall specifically guarantee the wood doors against warpage, twist, showing core lines, splitting, delaminating, and sag.

PART 2 - PRODUCTS

2.1 Wood Flush Doors

.1 Solid core: To CAN/CSA-0132.2.1.
.1 Construction: longitudinally laminated structural plywood stile and rail frame bonded to solid particleboard core; stiles 108mm, rails 57mm. Standard of Acceptance: Baillargeon 8500.

.2 Face Panels:

.1 Painted: Sound Grade, Birch species.

.3 Adhesive: Type II (water resistant) for interior doors or Type I (waterproof).

2.2
Fabrication

.1 Construct doors and use materials conforming to CAN/CSA 0132.2 and AWI / AWMAC / WI Architectural Woodwork Standards.

.2 Provide minimum 12mm thick vertical hardwood edge strips.

.3 Prepare doors for louvres and glazing. Use hardwood stops to match face veneer. Mitre corners of stops. Dimension stops not to interfere with lock installation or operation.

.4 Bevel vertical edges of single acting doors 3mm in 50mm on lock side and 1.5mm in 50mm on hinge side. Radius vertical edges of double acting doors to 60mm radius.

.5 Provide solid stiles and rails for adequate fastening of hardware specified.

.6 Factory undercut doors where indicated.

.7 Seal top and bottom of doors and edges of all cut-outs.

.8 Provide solid matching hardwood astragal on key side of pairs of lockable doors.

.9 Provide rated doors with ULC or Warnock-Hersey Label.

PART 3 - EXECUTION

3.1
Installation

.1 Install fire rated doors in accordance with National Fire Codes, Volume 4 produced by NFPA.

.2 Uncrate doors and seal faces, door edges and edges

of cut-outs to CAN/CSA 0132.2, Series, Appendix A.

.3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-0132.2 Series, Appendix A.

.4 Adjust hardware for correct function.

.5 Install glazing in accordance with Section 08 80 00. Install glazing in fire rated doors in accordance with labelling requirements. Confirm proposed location of certification label is acceptable to Consultant.

.6 Install stops.

.7 Secure transom panels by means of concealed fasteners.

.8 Ensure clearances on rated doors and doors in fire separations do not exceed 6mm at bottom and 3mm at sides and top.

.9 Provide even margins between doors and jambs and between doors and finished floor/thresholds as follows:
- .1 Latch side: 2.4mm
- .2 Head: 2.4 to max 3.0mm
- .3 Floor/threshold:
  - .1 Fire Rated Fire Separations: max 6.0mm
  - .2 Other: 9-12mm

3.2
Adjustment

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Track Support — See Drawings

.2 Supply of master keyed cylinders: — Section 08 71 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Submit product data, specifications and installation instructions. Indicate each grille, arrangement of hardware, operating mechanism and required clearances, materials, finishes, hardware.

1.4 Maintenance Data

.1 Provide operation and maintenance data for grilles and hardware for incorporation into maintenance manual specified in Section 01 30 00.

PART 2 - PRODUCTS

2.1 Materials

.1 Aluminum: Extrusions to ASTM B211, sheet and plate to ASTM B209, bars and rods to ASTM B211: Alloy 6063 with T-5 temper.

.2 Steel: Plate to ASTM A36, galvanized sheet to ASTM A526 with G90 coating, pipe to ASTM A53.

2.2 Grilles

.1 Curtain: ⅛" x ⅝" flat horizontal links connected to vertical 5/16" diameter aluminum rods. Link spacing: 12" o.c. Secure links in place by ½" diameter aluminum sleeves over alternating vertical rods. Rod spacing: 2" to 3½" o.c. Fabricate top and bottom using min. 13ga. aluminum panels.

.2 Overhead Track: Fabricate track using heavy duty extruded aluminum 15/16" wide x 1 9/16" high. Join track sections by partially inserting splicing pins and splice plates into performed receivers formed in track.

.3 Rollers: Double 1⅛" x ¼" vinyl tire with ball bearing inner race mounted on ½" steel shaft.

.4 Posts: Heavy duty extruded aluminum post hung from track by roller assembly.
.1 Lead post with wall striker: Adams Rite hook lock operated by mortise cylinders on both sides. Lock to engage full height wall striker.
.2 Intermediate post: heavy duty extruded aluminum equipped with concealed, cylinder controlled locking device operable from one side. Locking device: 7/16" diameter cold rolled steel shoot bolt and concealed latch mechanism, engaging a dust proof floor socket. Locate at max. 10' o.c.
.3 End post: heavy duty extruded aluminum secured to wall.
.4 Prepare locks for cylinders specified in Section 08 71 00.

.5 Weight: max. 1.3lbs/sq.ft.

.6 Manufacturer:
.1 Drawings are based on Dynamic "Starlite S-126S".
.2 Equivalent products by the following manufacturers are acceptable provided they meet this specification. Changes to the work necessitated by use of the following equivalents shall be entirely the responsibility of the sliding grille manufacturer and be satisfactory to the Consultant.
.1 Dynaflair "S-126."
.2 Mobilflex "System S-126."
.3 Amstel "Classic 126."

2.3
Finishes .1 Exposed aluminum: clear anodic finish; Aluminum Association designation AA-M12C22A31, Class 2.

2.4
Operation .1 Equip grille for operation by hand.

PART 3 - EXECUTION

3.1
Installation

.1 Erect grilles in accordance with manufacturer's printed instructions.

.2 Adjust operating components to ensure smooth opening and closing of grilles.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1	Formed Steel Door Frames	Division 05
.2	Finish Painting	Section 09 91 00
.3	Electrical Power Supply	Division 26

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Design Criteria

.1 Design exterior door assembly to withstand windload of 1kPa. Design with a maximum horizontal and vertical deflection of 1/240 of opening width.

.2 Design door assembly to withstand minimum 50,000 cycles.

.3 Design exterior steel doors to provide min. RSI of 2.8.

1.4 Qualifications

.1 Door fabricator shall have min. seven years experience in actual production of specified product.

.2 Installer shall be approved by manufacturer.

1.5 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Indicate sizes, materials, arrangement, service rating and type of hardware, glazing locations and details, operating mechanisms, required clearances, necessary mounting pads and supports, electrical characteristics including voltage, size of motors, auxiliary controls and wiring diagrams.

.3 Coordinate location of hardware, operator, auxiliary controls, and door sizes with site conditions.

1.6 Maintenance Data

.1 Provide operation and maintenance data for overhead door hardware and operator for incorporation into Operation and Maintenance manual specified in Section 01 30 00.

PART 2 - PRODUCTS

2.1
Materials

.1 Prefinished steel sheet: Commercial quality sheet steel to ASTM A653 with Z275 zinc coating and factory precoat 8000 series two coat modified silicone finish, conforming to CSSB1 Bulletin No. 7, with dry film thickness of 0.025mm on exposed surfaces. Colour: White.

.2 Galvanized steel sheet: commercial quality to ASTM A1008/A1008M-05b with Z275 zinc coating.

.3 Touch-up Primer: zinc rich to CAN/CGSB 1.181, for galvanized steel surfaces.

.4 Cable: multi-strand galvanized steel aircraft cable.

.5 Insulation: fire retardant foamed-in-place isocyanurate, min. 40kg/m³ density; to CGSB 51.26M.

.6 Wood preservative: to CSA A132.1, clear, penetrating water repellant wood preservative.

.7 Glazing: 18mm sealed insulated units, 3mm heat strengthened clear glass.

.8 Aluminum Extrusions: Aluminum Association alloy AA6063-T5.

.9 Aluminum sheet: to ASTM B209M plain anodizing quality aluminum sheet.

.10 Primer: to CAN/CGSB-1.105 for steel, [to CAN/CGSB-1.213 for aluminum, to CGSB-1.181 for galvanized steel surfaces.

2.2
Doors, Insulated Steel

.1 Fabricate 45mm thick, insulated, flush doors of roll formed, ribbed, steel sections.

.2 Provide 0.60mm base thickness prefinished steel sheet face and 0.60mm base thickness prefinished back-up steel sheets.

.3 Mechanically interlock exterior and interior skins with ship-lap shaped extruded thermal break section.

.4 Provide solid wood blocking behind all hardware and up panel ends. Dip wood components in penetration preservative and touch up coats before assembly.

.5 Install insulation between framing members and sheet steel faces.

.6 Fabricate panels with stiffeners and struts as appropriate to door size and design criteria.

.7 Provide weather tight horizontal panel joints.

.8 Fabricate door from prepainted steel stock.

2.3
Doors, Aluminum

.1 Fabricate aluminum rails and stiles of min. 3.0mm extruded aluminum tubing fastened with min. 6mm dia. galvanized through rods.

.2 Use 51x51mm thick tubing with shiplapped weathertight horizontal joints. Provide aluminum stiffened fins and aluminum struts as appropriate to door size and design criteria.

.3 Install glazing in weathertight, shock absorbing, vinyl mouldings, removable from inside only.

.4 Fabricate rails with integral reinforcing fins and aluminum T-struts.

2.4
Hardware

.1 Track: Min. 2.7mm core thickness galvanized steel, high and low head room lift hardware with 75mm track. Include ancillary hardware items. Min.380mm radius curve.

.2 Spring Counter Balance: heavy duty oil tempered Torsion Spring.
.1Drum: min. 100mm dia. cast iron, tapered.
.2Shaft: min. 25mm dia. cold rolled solid steel, galvanized running on ball bearings at gusset plates and intermediate shaft brackets.
.3Springs: 100% reserve capacity, be accessible and adjustable.

.3 Rollers: Pairs of twin, full floating, grease packed, hardened steel, ball bearing, stamped steel tires, and solid steel shafts, size to suit track. .

.4 Roller brackets: adjustable, min. 2.5mm galvanized steel. Provide double top roller brackets.

.5 Hinges: Min. 2.3mm thick, galvanized, commercial, bolted-on with adjustable roller holders. End hinges to be adjustable.

.6 Cable: min. 5mm dia. galvanized steel aircraft cable.

.7 Top roller carrier: galvanized steel, min. 2.3mm thick, adjustable.

.8 Bottom roller brackets: designed to wrap around bottom corner of door as well as acting as bottom roller carrier. Fit with pick-up for cable anchoring device.

2.5
Accessories

.1 Continuous steel angle track supports: Horizontal supported and cross braced by steel angle hangers. Horizontal min. 5mm thick. Vertical min. 2.5mm thick.

.2 Bulb type extruded neoprene weatherstrip for door sill section, full width.

.3 Extruded aluminum and arctic grade vinyl double weatherstrip for jambs and head, to manufacturer's standard, adjustable.

.4 Horizontal section double weather seals and pressure equalization; self-draining. Provide thermal break on insulated steel door edges and ends.

.5 Cable slack take up device.

.6 Cleat and keeper for hand chain.

.7 Steel mounting plates for torsion springs, motors.

.8 1.4m x 5mm galvanized track guards.

.9 Two horizontal sliding lock bolts on interior of manually operated doors.

.10Insulated aluminum panels: 1.2mm aluminum facing sheets pressure laminated to 128kg/m³ rigid mineral fibre insulation core. Use water and heat resistant adhesive capable of retaining bond strength at up to 120°C.

2.6
Finish

.1 Finish ferrous hardware items with minimum zinc coating of 380g/m^2 to CSA G164-M92.

.2 Clear Anodized: Finish aluminum components in accordance with Aluminum Association Designation Systems of Aluminum Finishes - 1980: Clear anodic finish; designation AA-M12C22A31, Architectural Class 2.

2.7
Operators

.1 Manual: galvanized steel 3:1 hand chain.

.2 Equip doors for electrical jack shaft type operation.

.3 Cable fail safe devices: able to stop door immediately if cable breaks on door free fall. Braking capacity 500kg.

2.8
Electrical Operator

.1 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA and ULC approval. NEMA, Type 1 General Purpose enclosure.

.2 Motor: standard duty industrial type rated for continuous duty adjustable friction clutch and solenoid brake. Motor to be readily removable without affecting limit switch adjustment. Motor to be instant reversing/stopping type.

.3 Power supply: 208V, 3 phase, 60Hz, Motor: 1/3 h.p.

.4 Controller units with integral motor reversing starter, 3 heater elements for overload and under voltage protection, including pushbuttons and control relays as applicable.

.5 Operation:
.1Interior remote push button station: surface mounted in one location to be selected, with "OPEN-STOP-CLOSE" constant pressure push buttons, key switch and pilot light as well as handheld remote control operator with constant pressure “OPEN-STOP-CLOSE” push buttons and pilot

light.

.6 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle. Provide coil cords and air switches.

.7 Provide intermediate stop limit switch set to open door only 2.5m. Bypass limit switch by pressing “OPEN” again.

.8 Design brake to stop and hold doors in any position and secure locking of door in closed position.

.9 For jack shaft operators:
.1 Provide floor level disconnect device to allow for manual operation in event of power failure.
.2 Equip operator with:
.1 Electrical interlock switch to disconnect power to operator when in manual operation.
.2 Built-in 3:1 galvanized steel chain hoist for manual operation in event of power failure.

.10 Door speed: 300mm per second.

.11 Control transformers: 24V AC for safety devices, and 120V AC for operating controls.

.12 Wiring and raceway standards: in accordance with Division 26.

.13 Mounting brackets: galvanized steel, size and gauge to suit conditions.

PART 3 - EXECUTION

3.1
Installation

.1 Co-ordinate location of hardware, operator, auxiliary controls and door sizes with site conditions and Owner’s requirements.

.2 Install doors and hardware in accordance with manufacturer's printed instructions.

.3 Set doors, plumb, square, true and secure. Bolt tracks to supports. Anchor mounting plates to structure.

.4 Touch-up doors where finish damaged during installation.

.5 Install electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operation.

.6 Installation includes electric wiring and conduit from power supply located near door opening.

.7 Lubricate springs and adjust door operating components to ensure smooth opening and closing of doors.

.8 Adjust weatherstripping to form a weathertight seal.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1	Supply of Some Door Hardware:	Section 08 71 00
.3	Glass and Glazing:	Section 08 80 00
.4	Aluminum Curtain Wall:	Section 08 51 00
.5	Wiring for Electronic Hardware:	Division 28
.6	Wiring for Security System:	By Owner

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 References

.1 ASTM E330-02 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

.2 CAN2/19.13-M87 Sealing Compound, One-component, Elastomeric Chemical Curing.

.3 CAN/CSA-G40.21-04 Structural Quality Steels.

.4 CSA G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 Design Criteria

.1 Construct doors, and frames to profiles and maximum face sizes as shown.

.2 Design frames in exterior walls to:
.1 Accommodate expansion and contraction within service temperature range of -35°C to 75°C.
.2 Limit deflection to 1/200th of clear span, 20mm, or flexural limit of glass which ever is the least when tested to ASTM E330 under wind load of 1.0kPa.

1.5 Samples

.1 Submit samples of enamel finish in accordance with Section 01 30 00.

1.6
Shop Drawings

.1 Submit shop drawings in accordance with Division 01 30 00.

.2 Indicate each type of door and frame extrusion profiles, method of assembly, section and hardware reinforcement, locations of exposed fasteners, finishes, etc.

.3 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

1.7
Maintenance Data

.1 Provide maintenance data for cleaning and maintenance of aluminum doors and cleaning of aluminum finishes for incorporation into manual specified in Section 01 30 00.

1.8
Warranty

.1 The warranty period stated in GC12.3 Warranty and relevant Supplementary Conditions, is, with respect to this section of work, extended from one year to three. Provide a written warranty in the form specified in Section 01 78 36.

.2 Warranty shall specifically guarantee against leakage and malfunction under normal use.

PART 2 - PRODUCTS

2.1
Materials

.1 Aluminum extrusions: Aluminum Association alloy AA6063-T5, anodizing quality.

.2 Sheet aluminum: Aluminum Association alloy AA1100, anodizing quality.

.3 Steel reinforcement: To CAN/CSA-G40.21, grade 300W.

.4 Fasteners: Aluminum, or stainless steel, finished to match adjacent material.

.5 Weatherstrip: Replaceable mohair/metal.

.6 Bottom seal: Adjustable door seal of extruded aluminum and nylon brush seal, surface mounted.

.7 Isolation coating: Alkali resistant bituminous paint or epoxy solution.

.8 Glass and glazing materials: In accordance with Section 08 80 00.

.9 Sealing Compound: To CAN/CGSB 19.13, Type 2, Movement Class 25, Class A, glazing, high modulus.

.10 Perimeter caulking: In accordance with Section 07 92 00 for exterior and interior sealants.

2.2
Aluminum Doors

.1 Construct doors of porthole extrusions with minimum wall thickness of 3mm. Door thickness :
.1 interior ; 45mm.
.2 exterior : 57mm insulated doors with 2.0mm thick extruded aluminum interior cladding thermally isolated from frame.

.2 Swinging doors: -3/+10mm
.1 Stiles nominal 89mm wide.
.2 Top rail nominal 89mm wide.
.3 Bottom rail nominal 165mm wide.

.3 Reinforce mechanically-joined corners of doors by welding, spigotting, welding and spigotting or by one piece cast aluminum angle to produce sturdy door unit.

.4 Glazing stops: Interlocking snap-in type for dry glazing. Exterior stops: Tamperproof type. Single glazing: stops bevelled. Double glazing stops: square.

.5 Build in reinforcement for all hardware.

2.3
Aluminum Frames

.1 Construct interior frames of aluminum extrusions with min. 3mm wall thickness.

.2 Frame members 45 x 115mm normal size for flush glazing.

.3 Subframes for exterior doors to be aluminum extrusions with minimum wall thickness of 3mm; size as indicated. Provide thermally broken sub-frames for thermally broken doors.

.4 Reinforce door jambs with internal steel member.

2.4
Finishes

.1 Clear Anodized: Finish aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes - 1980: Clear anodic finish; designation AA-M12C22A31, Architectural Class 1.

.2 Finish steel clips and reinforcing steel with min. 0.46kg/m^2 zinc coating to CSA G164.

.3 Finish schedule :
.1 Front entrance and vestibule doors and frames ; clear anodized finish.

2.5
Fabrication

.1 Doors and framing to be of same manufacture.

.2 Fabricate doors and frames to profiles and maximum face sizes called for. Provide min. 22mm bite for insulating glazed units.

.3 Provide structural steel reinforcement as required.

.4 Fit joints tightly, with flush hairline joints where exposed, and secure mechanically.

.5 Conceal fastenings.

.6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided by hardware supplier. Provide pull cords through assemblies for wiring.

.7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

.8 Extend screen framing mullions to structure above.

.9 Manufacturer's nameplates on doors or frames are not permitted.

.10 Manufacture:
.1 Swinging Doors (exterior): Kawneer 350 Series Doors.
.2 Swing Doors (interior): Kawneer 190 series door.

.3 Interior Framing: Kawneer 450.

.4 Equivalent doors and frames by the following manufacturers are acceptable, provided they meet this specification. Changes to the work necessitated by use of the following equivalents shall be entirely the responsibility of the window manufacturer and be satisfactory to the Consultant.

.1 Alumicor 400.

.2 Alumicor 1800.

2.7
Hardware Schedule

.1 Conform to Section 08 71 00.

.2 Finish to match door finish except as noted.

.3 Provide hardware for aluminum doors as listed in Section 08 71 00.

.4 Provide cylinder housings to suit cylinders supplied under Section 08 71 00.

.5 Install hardware supplied under Section 08 71 00 for aluminum doors.

PART 3 - EXECUTION

3.1
Installation

.1 Set frames plumb, square, level, at correct elevation, in alignment with adjacent work.

.2 Anchor securely.

.3 Install doors and hardware in accordance with templates and manufacturers' instructions.

.4 Install hardware specified in this section and in Section 08 71 00. Install in conformance with Section 08 71 00.

.5 Adjust operable parts for correct function.

.6 Make allowances for deflection of curtain wall, entrance screening and structure. Ensure that curtain wall and

entrance framing loads are not transmitted to door frames, nor structural loads transmitted to aluminum framing.

3.2
Glazing

.1 Glaze interior aluminum doors with 6mm clear tempered glass.

.2 Glaze exterior aluminum doors with sealed double glazing as follows:
.1 Outer Pane: clear tempered glass, 6mm thick.
.2 Inner Pane: Clear tempered glass, 6mm thick.

.3 Glaze interior screens with clear glass, min. 6mm thick. Glass between floor and door head level to be tempered.

.4 Glaze in accordance with 08 80 00.

3.3
Sealing

.1 Seal between members of aluminum work to provide a weathertight seal at outside and air/vapour seal at inside.

.2 Apply sealant in accordance with Section 07 92 00. Conceal sealant within the aluminum work except where exposed use is permitted by Consultant.

3.4
Perimeter Caulking

.1 Caulk perimeter of installation inside and outside in accordance with Section 07 92 00.

3.5
Cleaning

.1 Remove as work progresses corrosive, hardening, or foreign matter or droppings, resulting from the work.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Anchor Plates Cast-in-Concrete: Division 05

.2 Firestopping: Section 07 84 00

.3 Aluminum Doors Frames and Screens: Section 08 41 00

.4 Glazing: Section 08 80 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 System Description

.1 Windows and Curtain Wall: Conform to CAN3-A440-00 including Appendix A.

1.4 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Indicate materials and large scale details for head, jamb and sill, profiles of components, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes, fasteners and caulking.

.3 Show waterproofing and condensation control methods and internal drainage details and methods.

1.5 Certificates

.1 Submit test reports from approved independent testing laboratory certifying compliance with specification requirements for:
- .1 Air leakage.
- .2 Water leakage.
- .3 Condensation resistance.
- .4 Thermal transfer resistance of frames.

.2 Submit manufacturer's certificate certifying compliance with specification requirements for:
- .1 Aluminum finishes.
- .2 Wind load resistance.

1.6
Maintenance Data

.1 Provide maintenance data for cleaning and maintenance of aluminum for incorporation into maintenance manual specified in Section 01 30 00.

1.7
Delivery and Storage

.1 Deliver material factory formed and ready for installation.

.2 Handle, deliver, and store material in a manner so as to prevent soiling, marring of finished surfaces, twisting, denting, and all other damage.

.3 Ship material with shop applied protection over finished surfaces and corners padded.

.4 Store at the site under cover and set above ground.

1.8
Environmental Requirements

.1 Do not install sealants where ambient or surface temperature is less than 5°C.

.2 Maintain this min. temperature during and after installation of sealants.

1.9
Warranty

.1 The warranty period stated in GC12.3 Warranty and relevant Supplementary Conditions, is, with respect to this section of work, extended from one year to three. Provide a written guarantee in the form specified in Section 01 78 36.

.2 Warranty shall specifically guarantee against leakage, defects, and malfunction under normal usage.

PART 2 - PRODUCTS

2.1
Materials

.1 Extruded aluminum: To ASTM B221M and Aluminum Association alloy AA6063-T5.

.2 Miscellaneous Trim and Flashing: To ASTM B209M; Brake

formed aluminum sheet metal of type and size to suit detailed conditions; sills min. 1.6mm thick, other min. 1.2mm thick.

.3 Steel attachments and reinforcement: To CAN/CSA G40.21-04, Grade 300W.

.4 Bolts, screws and fasteners: Type 304 stainless steel, or cadmium plated 400 series stainless steel; of adequate strength for the purpose. Use Type 304 or 316 stainless steel where fasteners penetrate pressure treated wood.

.5 Thermal Isolators: Extruded rigid polyvinyl chloride hardness 80 durometers or high strength polyurethane.

.6 Sealing Compound: One-component, high modulus, to CAN/CGSB-19.13-M87, Type 2, Movement Class 25, Class A, glazing, compatible with sealed units.

.7 Perimeter Sealants: In accordance with Section 07 92 00 for exterior and interior sealants. Colours as selected by Consultant.

.8 Glass and glazing materials: In accordance with Section 08 80 00.

.9 Bedding compound: Butyl caulk to CGSB 19-GP-14-1984.

.10 Isolation coating: Alkali resistant bituminous paint to CAN/CGSB 1.108, without thinner.

.11 Zinc rich primer: To CAN/CGSB-1.181-99.

2.2
Glazing and Sealing
Compound Materials

.1 Sealing Compound: One component, to CAN/CGSB-19.13, Type 2, Class A, compatible with sealed units. Clour: As selected by Consultant.
  .1 Heel an toe beads (airseals): Ployurethane: Acceptable Products: Tremco Dymonic.

.2 Butt Glazed Weather Sealant: Tremco Spectrum 2, GE Silpruf or Dow 795. Colour: Black.

.3 Structural Sealant: Neutral cure/component, GE Ultraglaze SSG 4000 or Dow 995. Colour: Black.

2.3

Fabrication

.1 Curtain wall and entrance frame and to be respectively of same manufacture.

.2 Fixed units: Medium duty units: TO CAN3-A440, with min. classification Fixed, B7, C5 and I67 and to profiles shown.
.1 Window sizes are based on Kawneer 518series, 165mm deep x 19mm wide section. Other manufacturers who provide a window section of similar profile, of equal or lesser width and of equal or greater depth and with a "tophat" portion not exceeding 50mm depth will also be acceptable.
.2 Glazing frames to be vented and drained.

.3 Projected ventilator units: Medium duty units with thermal break: To CAN3-A440-M90 with min. classification A3, B7, C5 and I60 bottom projected out “awning”, units to profiles shown. Frames to be vented and drained.

.4 Curtain Wall: s.d.g., thermally broken, vented and drained, curtain wall framing **64**mm wide with 19m cap section and back section of depths indicated.
.1 Curtain wall is based on Kawneer 1600 Series.
.2 Other manufacturers are Alumicor.

.5 If election is made to use one of the “other” named manufacturer’s products ascertain design criteria can be met and be responsible for any changes required by use of product selected.

.6 Fabricate units square and true with maximum tolerance of;
.1 ±1.5mm for units with diagonal measurement of 1.8m or less, and
.2 ±3mm for units with diagonal measurement over 1.8m,
.3 ±3mm cumulative tolerance for other grid intersections on the same plane.

.7 Make allowance for deflection of structure. Ensure that structural loads are not transmitted to windows.

.8 Provide structural steel reinforcement as required for adequate strength, stiffness and connection.

.9 Provide concealed clip angles, fixing bars and the like of design, strength and durability necessary to anchor windows to structure; min. 1.9mm galvanized steel or min. 3.0mm aluminum.

.10 Make allowance of expansion and contraction of building

cladding.

.11 Make joints hairline thin. Fill all joints exposed to the elements with sealing compound before being drawn together and mechanically fastened.

.12 Conceal all fasteners.

.13 Provide min. 16mm bite for factory sealed double glazing units.

.14 Manufacturer's and fabricator's nameplates on windows are not acceptable.

.15 Provide all required trim, sills, drips, accessories, gasketting and fasteners. Fabricate sills using min. 1.6mm thick aluminum sheet.

.16 Form and seal metal back pans to be air/vapour barrier.

.17 Reinforce door jambs with internal steel member.

.18 All horizontal members must form individually pressure equalized and sealed gutter members, each with min. two drainage holes.

.19 Glazing pocket fillers: Use frame manufacturer's non-conductive, moisture resistant components; wood blocking and sheet metal fillers unacceptable.

.20 Extend entrance framing mullions to structure above.

.21 Provide cut outs and pull cords through framing to run wiring for security system to suit Owner's requirements.

2.4
Finishes

.1 Clear Anodized: Finish aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes - 1980: Clear anodic finish; designation AA-M12C22A31, Architectural Class 2.

.2 Finish steel clips and reinforcing steel with min. 600g/m² zinc coating to CSA G164-M92 (R2003).

.3 Touch-up primer for galvanized steel surfaces: Inorganic zinc rich primer to CAN/CGSB 1.181-99.

.4 Finish Schedule :

.1 interior back section; clear anodized finish
.2 exterior mullion caps:
  .1 “white” to be PPG Duranar UC72638
  .2 “black” to be PPG Duranar UC40577
  .3 “network gray” to be PPG Duranar Onyx Gray Metallic BK 20483KL

.3 Aluminum Spandrel Panels:
  .1 “network gray” to be PPG Duranar Onyx Gray Metallic BK 20483KL

2.5
Isolation Coating

.1 Isolate aluminum from following components, by means of isolation coating:
.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
.2 Concrete, mortar and masonry.
.3 Wood.

2.6
Glazing

.1 Prepare frames and sash to accommodate glass and glazing method specified in Section 08 80 00, as called for in article 3.2 and as recommended by glass manufacturer.

PART 3 - EXECUTION

3.1
Examination

.1 Verify dimensions, tolerances, and methods of attachment with other work.

.2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2
Curtain Wall
Installation

.1 Install windows and curtain wall in accordance with CAN3-A440, recommendations and manufacturer's instructions.

.2 Set aluminum work plumb, square, level, free from warp, twist, and superimposed loads.

.3 Secure work adequately and accurately to structure in

required position, in manner not restricting thermal or wind movement. Final anchor settings after alignment.

.4 Anchor component parts to transmit loads and other stresses to anchorage system and hence to structure.

.5 Provide continuous galvanized steel or extruded aluminum clip angles fixing bars and the like necessary to anchor windows to structure.

.6 At welds and other damaged galvanized coatings, touch-up with zinc rich primer.

.7 Field measure and cut to fit aluminum flashings and miscellaneous trim. Fill voids with glass fibre insulation or expanding foam insulation a indicated.

.8 Extend curtain wall mullions to structure above where indicated.

.9 Coordinate attachment and sealing of perimeter air barrier, vapour retarder, and peel and stick membranes.

3.3
Glazing

.1 Glaze fixed curtain wall with sealed insulated units:
.1 Outer pane: Tinted, heat absorbing, glass, tempered.
.2 Inner pane: Clear float glass with low E coating on outer surface.

.2 Use same thickness of tinted glass for all windows.

.3 Glaze in accordance with Section 08 80 00.

3.4
Insulation:

.1 Comply with section 07 21 00, Article 3.1.

.2 Fill perimeter voids of window frames and voids between perimeter window frames and adjacent construction with foam-in-place insulation in accordance with Section 07 21 00.

3.5
Sill Installation

.1 Install metal sills with uniform wash to exterior of min. 5% slope, level in length, straight in alignment with plumb

upstands and faces. Use one piece lengths at each location under 2.4m. .

.2 Cut sills to fit window opening.

.3 Fold up inside edge and ends to form integral dams.

.4 Form down leg to cover cladding min. 50mm except as otherwise noted.

.5 Secure sills in place with anchoring devices located at ends, joints and evenly spaced 600mm o.c. in between.

.6 Fasten expansion joint cover plates with self tapping stainless steel screws.

.7 Maintain 6 to 9mm space between butt ends of continuous sills. For sills over 1200mm in length, maintain 3 to 6mm space at each end.

.8 Radius end corners of drips where sharp corners may pose hazard such as playyards and other areas frequented by public or occupants on ground floor.

3.6
Trim Installation

.1 Fabricate aluminum trim and flashings as indicated. Field measure and cut to fit.

.2 Locate joints at equal intervals and in line with building grid to Consultant's prior approval.

.3 Form pieces in max. 3.00m lengths. Make allowance for expansion and contraction.

.4 Arrange fasteners and attachments to ensure concealment from view.

3.7
Caulking

.1 Seal joints between frame members and other non-operating components with sealant to provide weathertight seal at outside and air, vapour seal at inside.

.2 Apply sealant in accordance with Section 07 92 00. Conceal sealant within aluminum work except where exposed use is permitted by Consultant.

.3 Caulk periphery of installation inside and outside, in accordance with Section 07 92 00.

.4 Seal joints between windows and window sills with sealant. Seal lap joints between curtain wall and sill by sealing sills into front glazing pocket.

.5 Seal lap joints in sills; seal laps with butyl bedding component within lap.

.6 Bed sill expansion joint cover plates and drip deflectors in butyl bedding compound.

3.8
Cleaning

.1 Remove as work progresses, corrosive, hardening, or foreign matter or droppings resulting from the work.

.2 Remove protective materials from prefinished aluminum surfaces.

.3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Additional Hardware for Aluminum Doors: Section 08 41 00

.2 Electrical Wiring of Hardware Devices: Division 26

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Reference Standards

.1 Standard hardware location dimensions in accordance with Canadian Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association except as noted.

1.4 Requirements of Regulatory Agencies

.1 Use only ULC listed and labelled hardware for labelled doors.

.2 Provide latching hardware and closers for doors in fire separations.

1.5 Hardware List

.1 Submit hardware schedule in accordance with Section 01 30 00 - Submittals.

.2 Indicate hardware proposed, including make, model, material, function, finish, and all other pertinent information. Such list shall be compiled by a registered A.H.C. member whose name shall appear on the frontispiece and who shall verify the appropriateness of all items.

.3 Submit catalogue cuts of hardware identifying each item.

.4 Furnish door and frame manufacturers with complete instructions and templates necessary for preparation of their work to receive hardware.

1.6 Maintenance Data

.1 Provide adjustment instructions and maintenance data, parts lists, and manufacturer's instructions for each type of closer, lockset, door holder, and exit device for incorporation in maintenance manual.

1.7
Maintenance Material

.1 Supply two sets wrenches for locksets, exit devices.

1.8
Keying

.1 Lay out the keying system in consultation with the Consultant and Owner. Keying systems shall include keying alike, keying differently, keying in groups, and master keying as required. Exterior doors to be keyed under different master key.

.2 Prepare and submit keying chart and related explanatory data for approval. Do not commence lock work until all written confirmation of keying arrangements is received from the Consultant.

.3 Door locks, padlocks and exit devices are to be keyed at the manufacturer's plant. This system shall be registered.

1.9
Delivery and Storage

.1 Store finishing hardware in locked, clean, and dry area.

.2 Pack each item of hardware, complete with all fasteners and necessary fittings. Label each carton and package as to item, definition, and location.

.3 Deliver and store materials undamaged in original wrappings or containers with manufacturer's labels intact.

.4 Maintain inventory list with hardware.

1.10
Inspection

.1 The A.H.C. member in the employ of this trade shall be directly responsible for inspection of the work, direction of the installation, and commissioning of the work. He shall make periodic inspection during installation of hardware to ensure that all hardware is being applied in accordance with specifications, details, and Manufacturer's and Consultant's directions. Inform the Contractor and the Consultant in writing immediately after each inspections, pointing out errors, omissions, etc., so that same may be corrected.

.2 At completion of the work, the A.H.C. member shall check the installation of all finish hardware, shall assist in making minor adjustments required, supervise all hardware replacements required and report to the Consultant on completeness of the installation.

.3 Use tradesmen competent in the installation of finishing hardware. Adjust clean and make good all finishing hardware to the satisfaction of the Consultant and A.H.C. member.

1.11
Warranty

.1 The warranty period in GC12.3 - Warranty and relevant Supplementary Conditions, is, with respect to this section of the work, extended from one year to two years. Provide a written warranty in the form specified in Section 01740.

PART 2 - PRODUCTS

2.1
Hardware Items

.1 Use one manufacturer's products only for all similar items. Hardware shall conform to the following minimum general requirements except as noted otherwise.

.2 Stainless steel items: AISI Type 302 or 304.

.3 Butts:
.1 To CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981. Use Hager Hinge. Equivalent items by Stanley Works or McKinney are acceptable.
.2 Use 1½ pair per door except use 2 pair for doors over 2180mm high. Use 4½ x 4" butts except use 5" x 4" for doors more than 1016mm wide. Use non-removable pins on exterior doors. Provide min. one NRP butt on outswinging doors; locate at centre hinge. Use stainless steel hinges on exterior doors, showers, and where called for. Use ball bearing hinges for all doors. Butts to be min. BB1279, and as additionally or otherwise called for. Finish C26D. Use C32D for exterior doors.

.4 Latches, Locksets and Cylinders: To CAN/CGSB-69.17-M90/ANSI/BHMA A156.2-1983, Grade 1
.1 Locks shall be Schlage “D” Series with RHO lever trim . Sargeant “8" or “10" line with LNL trim . Where knob sets are indicated use Orbit /GRC/OB/4C trim. Provide strikes as required for latches and locksets specified. Use non-ferrous components for exterior and shower doors. Provide rim or mortise cylinders to suit, for aluminum doors, exit devices, padlocks, etc. Provide mortise locks on exterior doors. Provide exterior doors with interchangeable cores. Finish C26D.

.5 Exit Devices: To CAN/CGSB-69.19-M89/ANSI/BHMA A156.3-

1984, modern (touch bar) design. Use Sergeant 80 series with FLW trim, or standard ETL lever, (c/w “Free wheeling” breakaway feature) where lever specified. Equivalent items in Corbin are acceptable. Hardware supplier to co-ordinate exact catalogue number and trim required. All devices to be key doggable unless fire rated. Include stabilizer blocks with removable mullions. Provide full door width devices. Cylinders to be masterkeyed. Finish C32D bar, C32D body.

.6 Closers: To CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Grade 1

.1 Use L.C.N. 4041/4040 unless noted. No substitute.

.2 Closers to have adjustable back checking action, separate regulating valves for door speed and latching speed. Provide manufacturer's 10 year warranty.

.3 Hardware supplier to provide and co-ordinate exact catalogue number, accessories and trim items required.

.4 All closers to be parallel arm and forged extra duty arm except as otherwise noted. Where noted as "Cush", provide built-in limiting stop to suit situation. No brackets permitted to extend into door openings. Finish: 689.

.5 Conform to requirements of Ontario Building Code for barrier free access. Doors to open when a force of not more than 38N is applied to the handles, push plates, or exit device for exterior doors and not more than 22N for interior doors. Interior doors to have a closing period of 5-10 sec. from 70° opening to 75mm from closing.

.6 Through bolt all closers on wood doors.

.7 Provide 62G lug shoe and bent arm 2730 where surface mounted overhead stop provided in conjunction with parallel arm closers.

.7 Door Stops:

.1 Use floor stops except as otherwise indicated. Floor stops to be cast bronze. Gallery #200B, 218B, or 250 as applicable, or identicals by CBH or Hager. Finish C26D.

.2 Overhead stops and holders: Use heavy duty type; surface for wood, exterior steel doors, stair doors, and as noted, low profile concealed units for aluminum and other metal doors; Glynn-Johnson, 90 and 100ADJ Series, respectively. Through bolt onto wood doors. Provide SK1052 special adaptor where parallel arm closer provided. Equivalent products by Rixson or Sergeant acceptable. Set angle to suit each door situation. Finish 26D.

.8 Push/Kick Plates:

.1 Stainless Steel. Provide stainless steel O.H. screws. Finish C32D.

.2 Kickplates: 1.25mm thick x 203mm high x full width of door except to clear stops; Gallery #80A or Hager HA 9550.

.3 Pushplates: 1.25mm thick x 103 x 508mm; Hager HA9500 or Gallery #81.

.9 Pulls:
.1 Exterior / Interior: Gallery #4009-1, or equal by Hager, CBH. Finish C32D.
.2 Conceal mounting behind push plates or provide back to back mounting.
.3 Cylinder pulls: HA2980. Finish 32D.

.10 Thresholds:
.1 Standard: KNC CT48.
.2 Handicap: KNC CT45.
.3 Extend thresholds for full width of door frame.
.4 Identical items by the following are also acceptable: Thomas, Hager, Pemko, Unique.
.5 Provide thermally broken threshold at all exterior doors.

.11 Weatherstripping:
.1 Exterior: KNC W20P, at jambs, head.
.2 Sweeps: KNC W24S.
.3 Smoke Seals: KNC W21 at jambs and head.
.4 Door Bottoms: KNC CT-52 surface auto door bottom.
.5 Identical items by some of the following are also acceptable: KNC, Thomas, Pemko, Unique, Hager.
.6 Provide weatherstripping on all exterior doors.

.12 Automatic Entrance Hardware:
.1 Conform to CAN/CGSB-69.35 Power assist and low energy power Operated Doors.
.2 GyroTech 500 Besam 455 Swingmaster MP or Horton 4000/7000 heavy duty surface operator. 1/10hp. 120vac. max. 5amp. CSA approved, c/w automatic reset and key operated power on/off switch. For each operator, provide two flush mounted 150mm dia. stainless steel activating switches, each with engraved barrier-free symbol. Provide 2 barrier-free decals per operator; locate as directed by Consultant. Adjust opening, closing, time delay, and safety stop to Owner's approval. Finish: clear anodized to match doors. Visible manufacturer's or installer's labels not permitted.

.13 Push to Lock Push Plate Enclosure & switch Kit : Camden CM54 illuminated, surface mt.

2.2

Hardware Types

.1 Conform to Articles 1.3 and 2.1 and as additionally indicated below.

Type 1A (EXTERIOR)

butts BB1279 SS NRP	32D
deadlock ARMS1851SW 000-1 strike x 4066 turn	26D
cylinder to suit	
cylinder housing (by section 08 41 00)	
2 exterior pulls	
Automatic operator LHR	AL
threshold handicap	
sweeps (by section 08 41 00)	
weatherstripping (by section 08 41 00)	

Type 1B (EXTERIOR)

butts BB1279 SS NRP	32D
deadlock ARMS1851SW 000-1 strike x 4066 turn	26D
cylinder to suit	
cylinder housing (by section 08 41 00)	
2 exterior pulls	
closer	
threshold handicap	
sweeps (by section 08 41 00)	
weatherstripping (by section 08 41 00)	

Type 2A (VESTIBULE)

butts BB1279	32D
2 exterior pulls	
Auto operator LHR	AL

Type 2B (VESTIBULE)

butts BB1279	32D
2 exterior pulls	
closer	

Type 3

butts
office lockset
closer
overhead stop (floor stop for D108)
kickplates

Type 4 (OFFICE)

butts BB1279	26D
office lockset	26D
floor stop	

Type 5 (HC WASHROOM)

Butts	
storeroom lockset	
electric strike	
auto operator	AL
floorstop	
robehook	
sign	
push to lock kit (on inside interlocked with operator)	

Type 6

butts BB1191 SS NRP	32D
rim exit device 98L	
cylinder to suit	
closer PA	
overhead stop, surface	
kickplate	
weatherstripping	
sweep	
threshold, standard	

Type 7 (GRILLE)

cylinder to suit	
cylinder housing (by section 08 41 00)	

Type 8 (CLOSET)

sliding closet kit KNC C600 x C200	
4 pulls KNC C75	26D

Type 9 (WASHROOM)

butts	
push	
pull	
closer	
sign	

Type 10 (STORAGE)

butts	
storeroom lockset	
floorstop	

Type 11(TOOLS)

butts
storeroom lockset
overhead stops
surface bolts
Kickplates

Type 12 (WASHROOM)
butts
privacy set
floor stop
sign

Type 13
butts BB1191 SS NRP 32D
deadbolt
overhead stops
flush bolts
chain pulls & chain rings
weatherstripping
sweep
threshold, standard

Type 14
butts
storeroom lockset
floor stop
auto door bottom (surface mount)
smoke seals

2.3
Fastenings

.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Exposed fastening devices to match finish of hardware.

.3 Where pull is scheduled on one side of door and pushplate on other side, supply fastening devices and install so pull can be secured through door from reverse side. Install pushplate to cover fasteners.

.4 Use fasteners compatible with material through which they pass.

2.4
Keying

.1 All locks to be master keyed and keyed to existing system. Exterior locks to be on different master key.

.2 All locks to be supplied with five (5) keys.

.3 Use nickel-silver keys.

.4 Stamp keying code numbers on keys and cylinders. Provide typed list indicating key code and lock location. Stamp all keys with relevant room number. Stamp; means punched with and hammer and die.

PART 3 - EXECUTION

3.1
Installation

.1 Furnish manufacturer's instructions for proper installation of each hardware component.

.2 Install hardware to standard hardware location dimensions in accordance with Canadian Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturer's Association.

.3 Set thresholds in two continuous beads of butyl caulking to requirements of Section 07 92 00.

.4 Cope thresholds around mullions and abutting door frames.

.5 Install kickplates, push plates, and weather/sound stripping after the final coat of paint completely dried and cured.

.6 Set angle for stops, holders, and stays to best suit each situation. Mount floor stops out of line of travel. Mount wall stops to strike bottom of pulls.

.7 Set closers and single door rim exit device strikes over weatherstripping so weatherstripping is uninterrupted.

.8 Mount robe hooks 1.2m from floor in barrier free washrooms.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Glass and Glazing of
- .1 Aluminum Doors, Frames and Screens: Section 08 41 00
- .2 Aluminum Windows and Curtain Wall: Section 08 51 00

.2 Toilet and Bath Accessories: Section 10 28 00

.3 Final Cleaning: Section 01 60 00

1.2
General

.1 The requirements of Division 01 form part of this section.

1.3
References

.1 American Society for Testing and Materials (ASTM International)
- .1 ASTM C542-94 (1999) Specification for Lock-Strip Gaskets.
- .2 ASTM D2240-04 Test Method for Rubber Property - Durometer Hardness.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 12.1-M90 Tempered or Laminated Safety Glass.
- .2 CAN/CGSB 12.3-M91 Flat, Clear, Float Glass.
- .3 CAN/CGSB 12.4-M91 Heat Absorbing Glass.
- .4 CAN/CGSB 12.8-M97 Insulating Glass Units.
- .5 CAN/CGSB 12.10-M76 Glass, Light and Heat Reflecting.
- .6 CAN/CGSB 12.11-M90 Wired Safety Glass.
- .7 CAN/CGSB 12.20-M89, Structural Design of Glass for Buildings.
- .8 CAN/CGSB 19.13-M87 Sealing Compound, One Component, Elastomeric, Chemical Curing.

1.4
Design Criteria

.1 Glaze in a manner to ensure weathertight and watertight seal for exterior glazing and rattle free cushioning for interior glazing.

.2 Conform to applicable criteria in Section 08 51 00, Aluminum Windows and Section 08 41 00 Aluminum Doors, Frames and Screens.

.3 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials.

.4 Size glass to withstand wind loads, dead loads and positive and negative live loads as calculated in accordance with Ontario Building Code.

.5 Limit glass deflection to 1/200 with full recovery of glazing materials.

.6 Use only glazing materials whose compatibility with insulating units has been confirmed in writing by insulating unit manufacturer.

1.5
Submittal

.1 Submit sealed unit performance data in accordance with Section 01 30 00.

.2 Submit 400x400mm samples of vision glasses in accordance with Section 01 30 00.

1.6
Glass Care

.1 Obtain and follow glass manufacturer's recommendations for glass care. Submit one copy in accordance with Section 01 30 00.

.2 Do not adhere warning signs or materials to glass materials.

1.7
Warranty

.1 The warranty period in CG12.3 and relevant Supplementary Conditions is, with respect to sealed double glazing units extended from one year to ten. Provide a written warranty in the form specified in Section 01 78 36.

.2 Warranty shall specifically guarantee against failure of seal of enclosed air space and deposits on inner face of glass detrimental to vision.

1.8
Maintenance Data

.1 Submit maintenance data including cleaning instructions in accordance with Section 01 30 00.

PART 2 - PRODUCTS

2.1
Glass Materials

.1 Thicknesses: As called for but not less than CAN/CGSB 12.20M.

.2 Float Glass: to CAN/CGSB 12.3, glazing quality.

.3 Tempered Glass: To CAN/CGSB 12.1, Type 2, Class B - float, min. 6mm thick.

.4 Wired Glass: To CAN/CGSB 12.11, Type 1, wire mesh style 3 (Georgian), min. 6mm thick.

.5 Heat absorbing insulated glass units: To CAN/CGSB 12.4, Type 2, sealed unit, heat absorbing, grey tint to match existing, tempered, heat strengthened outer pane and low emissivity metallic coating on clear inner pane, min. visible light transmittance 35%, max. outdoor visible reflectance 10%, max. shading coefficient 0.29, max. winter/night thermal transmittances 0.29 BTU/hr.ft².F, max. SHGC 0.25. Based on PPG Solarban 60 (2) on SolarGrey. Outer pane tempered.

.6 Insulating glass units: To CAN/CGSB-12.8
- .1 25mm total thickness.
- .2 Double glazed unit, IGMAC certified.
- .3 Warranty: 10 years.

.7 Spandrel glass: To CAN/CGSB 12.9,..... colour, heat strengthened, reflective, monolithic, ceramic frit and solvent based polyester film opacifier. Reflectance and colour to match insulated glass units.

.8 Mirror glass: To CAN/CGSB-12.5, silvered, Type 1A-float glass for normal use , 6mm thick, unframed, ground and polished edges.

.9 Doors: Use min. 6mm thick glass, tempered except where wired glass required. Temper both panes where insulated units required for exterior doors and sidelights.

.10 Interior Glazing: within 2m of finished floor: min. 6mm thick glass, tempered except where wired glass required.

.11 Edge delete soft/sputter coat and coatings before fabrication of insulated glass units.

.12 Exterior glazing: Use tempered glass for exterior pane of all windows, and curtain wall.

2.2
Glazing and Sealing Sealing Compound

Compound Materials

.1 Sealing Compound: One component, to CAN/CGSB-19.13, Type 2, Class A, compatible with sealed units. Colour: As selected by Consultant.

.1 Heel and toe beads (airseals): Polyurethane: Acceptable Products: Tremco Dymonic.

2.3
Accessories

.1 Setting Blocks: Neoprene or EPDM 80±5, Shore "A" durometer hardness to ASTM D2240, width 1.5mm more than glass thickness, x length 28mm/m^2 of glass but not less than 100mm long x thickness to provide bite recommended by glass manufacturer, but min. 6mm and max. 18mm, unless otherwise recommended by glass manufacturer. In vented systems design setting blocks to not restrict water flow to weep holes.

.2 Spacer Shims: Neoprene, Shore "A" durometer hardness 50±10, 75mm long.

.3 Glazing Tape:

.1 Preshimmed glazing tape: Preformed butyl tape, 10-15 durometer hardness, paper release, incorporating continuous EPDM spacing shim. Acceptable products: Tremco Polyshim II.

.2 Glazing tape: Preformed butyl tape, 10-15 durometer hardness, paper release. Use only for interior glazing.

.3 Composite glazing tape/spline: Combined EPDM shim upper portion at sight line and preformed butyl glazing tape lower portion. Acceptable products: Tremco "Vision-strip".

.4 Foam tape: Closed cell pvc foam, paper release, adhesive on two sides, max. 2% water absorption by volume, designed for 25% compression, to effect an air and vapour seal, 1.5mm thickness.

.4 Edge Blocks: Material and hardness to provide proper edge clearance as recommended by glass manufacturer.

.5 Glazing splines, gaskets and bulbs: Resilient, extruded neoprene or EPDM, to ASTM C542 shape designed specifically for use in window section, hardness balanced to glazing tape shim.

.6 Primer-sealers and cleaners: To glass and sealant manufacturer's recommendations.

.7 Tape, gasket, bulb and spline colour: Black.

PART 3 - EXECUTION

3.1
Workmanship

.1 Set glass properly centred, with uniform face and edge clearance, free from distortion causing stress.

.2 Cut glass to suit actual field dimensions with allowances recommended by glass manufacturer for contraction and expansion of glass.

.3 Remove protective coatings and clean contact surfaces with solvent and wipe dry.

.4 Apply primer-sealer to contact surfaces.

.5 Place setting blocks as per manufacturer's instructions.

.6 Install glass, rest on setting blocks, ensure full contact and adhesion at perimeter.

.7 Install removable stops, without displacing tape or sealant.

.8 Provide minimum clearance as follows:
.1 Unit less than $1m^2$: 3mm.
.2 Unit $1m^2$ to $2m^2$: 5mm.
.3 Unit greater than $2m^2$: 6mm.

.9 Provide watershed to splines, gaskets, and bulbs from glass to stop. Apply glazing tapes flush with sight line.

.10 Apply cap bead sealant to uniform and level line, close to sightline and tooled or wiped with solvent to smooth appearance. Provide water shed profile.

.11 Do not cut or abrade tempered, heat treated, or coated glass.

.12 Do complete work to provide a leakproof installation.

.13 Do not adhere warning signs or materials to glass materials.

3.2
Exterior Glazing

.1 Systems Glazed From Outside:
.1 Glaze (and install back pans) in accordance with system manufacturer's recommendation.
.2 Arrange pressure plates to allow drainage from top half of rails. Do not provide pressure plate vent holes at top of sealed units.
.3 Interior and exterior dry gaskets:
.1 Apply sealant and joint plugs at ends of rails to compartmentalize each lite.
.2 Apply sealant continuously to inside corners of back pan flanges and batten mullion/rail faces with sealant before installing back pans. Seal face of adaptors at back pan to mullion/rails.
.3 Seal glazing gasket reglets for 75mm from corners immediately prior to gasket installation.
.4 Cut gaskets to proper lengths.
.5 Seal screw heads on top half of rails.
.6 Bed pressure plates is continuous bead of sealant.
.7 Seal face of joint plugs prior to installing vertical pressure plates.

.4 Exterior glazing tape/interior bulb/gasket: Install gasket or bulb as specified. Apply interior toe bead of sealant at corners. Install transom plugs and toe bead of sealant to compartmentalize each lite. Cut glazing tape to proper lengths and set against stops.

.5 Interior glazing tape/exterior gasket: Cut glazing tape to proper lengths and set against stops. Weld corners together by butting tape and dabbing with sealant. Apply interior toe bead of sealant at corners. Install transom plugs and toe bead of sealant to compartmentalize each lite. Install gasket as specified.

3.4
Installation of Splines, Gaskets and Bulbs

.1 Unpack and lay out splines, gaskets and bulbs on flat warm area to permit recovery of shape.

.2 Install splines, gaskets and bulbs under compression.

.3 Install splines to manufacturer's directions.

3.5
Interior Glazing

.1 Glaze pressed steel frames and hollow metal doors as follows:
.1 For exterior lites and lites over 1900 united mm (75 united inches), use preshimmed glazing tape.
.2 Place glazing tape on free perimeter of glass in same manner described above.
.3 Cut glazing tape to length and install against stops, flush with sightline.
.4 Use max. 1.6mm thick glazing tape.

.2 Insert spacer shims to centre glass in space. Locate on four sides and directly opposite on both sides of glass. Place shims at 600mm o.c. and keep 6mm below sight line. Alternately, use preshimmed glazing tape.

.3 Glaze wood doors and wood frames using foam tape.

3.6
Finishing

.1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

END OF SECTION

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LEGEND

			NEW	EXISTING
Floors				conc.
	CONC.	Concrete		vct
	VCT	Vinyl composition tile		-
	QT	12" X 12" Porcelain tile		-
Base	R	rubber, 100m ht.		r
Walls	D	Drywall		d
	B	Concrete Block		b
	CT	Ceramic tile 400 x 100		-
	ML	Metal liner		-
	PL	Plywood		-
Ceiling				
	D	Drywall		d
	LIT	Lay in tile, 610 x 1220		lit
	LIT-F	Fire rated lay in tile , 610 x 1220		lit-f
	LIT*	Lay in tile panels in existing grid		-
	ES	Exposed structure		es
Finish	P	Paint		p

NOTES:

1. Finish all new interior surfaces. Paint all surfaces in rooms being refinished.
2. Paint all interior doors and frames within work area.

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Room No.	Room Name	Floor	Base	Walls North	East	South	West	Ceiling Type	Ceiling Ht.	Remarks
101	VESTIBULE	QT	QT	glazed	D-P	D-P	glazed	D-P		
102	DRIVERS LOUNGE	QT	QT	d-p	D-P	D-P	d-P	LIT-F		
103	SERVICE COUNTER	QT	QT	-	D-P	d-P	-	LIT- F		
104	WOMENS WR.	QT	QT	CT	CT	CT	CT	D-P	2600	
105	MENS WR.	QT	QT	CT	CT	CT	CT	D-P	2600	
106	UNIVERSAL WR.	QT	QT	CT	CT	CT	CT	D-P	2600	
108	SERVICE	QT	QT	D-P	D-P	D-P	-	LIT	2600	
109	SERVICE ADVISOR	QT	QT	D-P	D-P	D-P	D-P	LIT	2600	
110	SERVICE MGR.	QT	QT	D-P	D-P	D-P	D-P	LIT	2600	
111	GSM	QT	QT	D-P	D-P	D-P	D-P	LIT	2600	
112	COPIER	QT	QT	D-P	D-P	D-P	D-P	LIT	2600	
116	OFFICE	QT	QT	d-P	d-p	d-p	d-p	lit	2400±	
118	F & I	QT	QT	D-P	D-P	D-P	D-P	LIT	2600	
119	RECEPTION	QT	QT	-	D-P	D-P	D-P	LIT	3050	
120	VESTIBULE	QT	QT	glazed	glazed	glazed	glazed	D-P	3050	
121	WAITING	QT	QT	D-P	-	D-P	D-P	LIT	3050	
122	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
123	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
124	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
125	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	

126	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	

Room No.	Room Name	Floor	Base	Walls North	East	South	West	Ceiling Type	Ceiling Ht.	Remarks
127	VESTIBULE	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
128	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
129	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
130	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
131	SALES	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
132	OPEN OFFICE	QT	QT	D-P	D-P	D-P	D-P	LIT	3050	
133	SHIPP / RECEIV.	conc.	R	d-p	d-p	d-p	D-P	LIT-F/lit	2450±	
134	EXIST OFFICE	QT	QT	d-p	d-p	d-p	d-p	LIT-f	2450±	
136	EXIST SERVICE	conc.	-	b-	D-P	b-	b-	es	5800±	paint new partitions
137	TOOL STORAGE	conc.	-	ML	ML	ML	ML	es	5800±	
138	TOOL STORAGE	conc.	-	PL	b-	PL	PL	es-	5800±	
139	EXIST STORAGE	conc.	-	b-P	B-P	b-P	b-P	es-	5800±	
140	EXIST SHOP	conc.	-	b-	b-	b-P	b-	es-	5800±	paint south wall
141	WASH BAY	CONC.	R	b-p	B-P	B-P	B-P	es-P	5600±	
	PRE ENG.									
	STOR.BLDG	CONC.	-	ML	ML	ML	ML	vinyl	6100±	

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	2ND FLR.									
	LUNCH RM	vct	r	d-p	d-p	d-p	d-p	LIT*	2450±	
	MENS LOCKER	QT	QT	d-p	d-p	d-p	d-p	LIT	2450±	
	WOMENS WR	QT	QT	D-P	D-P	D-P	D-P	LIT	2450±	

PART 1 - GENERAL

1.1
Related Work

.1 Structural Metal Stud Framing: Section 05 41 00

.2 Gypsum Board in Connection with Roofing: Section 07 52 00

.3 Supply of Access Doors & Plaster Rings as Required: Divisions 22 and 23

1.2
General

.1 The requirements of Division 01 form part of this section.

.2 All material shall be asbestos free.

1.3
Reference Standards

.1 Do work to CSA A82.31-M1980, except as otherwise noted.

.2 Install steel framing systems to ASTM C754-04, except as otherwise noted.

.3 Install gypsum board to ASTM C840-04 except as otherwise noted.

.4 Install gypsum sheathing to ASTM C1280-04 except as otherwise noted.

1.4
Samples

.1 Submit duplicate 400 x 400mm sample of soffit and texture finish in accordance with Section 01 30 00.

1.5
Submittals

.1 Submit MSDS data for acoustic caulking and adhesives in accordance with Section 01 30 00. Indicate VOC content.

.2 Provide shop drawings stamped by an Ontario P. Eng. to demonstrate compliance with OBC for seismic design requirements for exterior stud walls, drywall partitions and suspended ceilings, and letter certifying compliance for Occupancy Permit.

PART 2 - PRODUCTS

2.1
Framing & Furring

.1 Non-load bearing channel stud framing to ASTM C645-04a, stud size as shown, roll formed from 0.53mm core thickness (except as otherwise noted) hot dip galvanized steel sheet, for screw attachment of gypsum board. Knock out service holes at 460mm centres.

.2 Floor and Ceiling Track: To ASTM C645-04a in widths to suit stud sizes, min. 32mm flange height.

.3 Drywall furring channels: 0.53mm core thickness electrogalvanized steel channels for screw attachment of gypsum board.

.4 Ceiling Runner Channels: 38mm cold rolled channels to CSA A82.30-M1980.

.5 Runners, hangers, tie wires, inserts, anchors: To CSA A82.30-M1980; galvanized.

2.2
Gypsum Board

.1 Plain: To CAN/CSA A82.27-M91 and ASTM C36-M03 standard, thickness as indicated. 1200mm wide x max. practical length, ends square cut, edges tapered with round edge.

.2 Fire Rated: As para. 2.2.1 but Type "X" and ULC labelled. Use where indicated and where required to provide fire ratings indicated.

.3 Exterior Sheathing: To ASTM C1177, 12.7mm thick x 1220mm wide x max. possible length. Water repellant gypsum core encased in water repellant glass fibre facings on both sides. Acceptable Products: Georgia-Pacific "Dens-Glass Gold" CGC “Securock”, or CertainTeed “Glasroc High Performance Exterior Sheathing”.

.4 Moisture Resistant: To ASTM C630-00, thickness indicated, fire-rated and labelled where indicated, 1200mm wide by max. practical length, green facing.

.5 Exterior Cement Board (foundation wall): to ANSI A118.9-1997, 13mm thick x 1.2m x 2.4m, aggregated Portland cement board with polymer coated, glass-fibre mesh embedded in front and back surfaces; polystyrene free, non-

combustible to CAN4 S114-05 or Type X. Acceptable Product: CGC "Durock" Exterior Cement Board.

.6 Joint treatment compound: Joint compound, joint tape, and topping compound to ASTM C475-01, asbestos free.

2.3
Fastenings and
Adhesives

.1 Screws: To ASTM C1002-01 and ASTM C954-04 Self drilling for studs 20ga. or thicker.

.1 Corrosion resistance of screws shall meet the following min. requirements when tested to 10% rust.

		ASTM B117 (hours)	and	Kesternich (cycles)
1	Sheathing; covered by sheet air/vapour or wind barrier.	96		------
2	Sheathing; not covered by sheet air/vapour or wind barrier.	720		30
3	Sheathing and Cement Board; with direct applied finish.	720		30
4	Other Exterior Cement Board.	500		20
5	Other.	24		-------

.2 Adhesive Compound: To CAN/CGSB 71.25-M88, asbestos free. VOC free

2.4
Accessories

.1 Casing beads, corner beads, control joints and edge trim: To ASTM C1047-99(2004). Fill type, 0.53mm base thickness commercial grade sheet steel with G90 zinc finish to ASTM A653-06a, perforated flanges, one piece length per location. Use only types the face of which are concealed with joint compound.

.2 Acoustic insulation: Mineral fibre blankets, to ULC S702 purpose made for wedging between metal studs: Thickness equal to stud width unless noted otherwise.

.1 min. 12kg/m^3 glass fibre or rock wool.

.2 Use 40kg/m^3 slag/rock wool, for fire-rated partitions. ULC labelled.

PART 3 - EXECUTION

3.1
Metal Stud Erection

.1 Provide partition tracks at top and bottom. Align accurately. Secure at 600mm o.c.

.2 Place studs vertically 400mm o.c. and not more than 50mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.3 Erect metal studding to tolerance of 1:1000.

.4 Attach studs to bottom track using screws. For ceiling height partitions, fasten studs to top track using screws.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work of other Sections.

.7 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together alongside frame anchor clips.

.8 Erect track at head and sill of openings to accommodate intermediate studs. Secure track to studs at each end, to framing manufacturer's instructions. For openings greater than 1m in width add two 19mm cold rolled runner channels over head of opening extending out to engage third stud on each side. Securely attach to each intersecting stud.

.9 Provide 40mm stud or furring channel secured between studs for attachment of fixtures and accessories attached to steel stud partitions.

.10 Install steel studs or furring channels between studs for attaching electrical and other boxes.

.11 Use furring channels to brace faces of studding which will be unfaced. Run horizontal bridging at max. 1.2m o.c. Screw attach both flanges of bridging to each stud.

.12 Diagonally brace bulkheads at max. 1.2m o.c.

.13 Set in place and secure steel door frames located in drywall as per Section 08 11 00.

.14 Extend studding to structure above except where indicated otherwise.

.15 Maintain clearance under decks, beams and joists to avoid transmission of structural loads to studs. Use 50mm leg outer top tracks nested over regular inner track.

.16 Extend framing for fire separation partitions to deck above. Box-in interfering structural joists and beams, pipes and conduits.

.17 At fire-rated door and window frames conform to ULC Bulletin G-21, including provision of back to back tracks at head of openings.

.18 At fire dampers frame all sides and; conform to ULC Bulletins 79-1 and 80-2.

.19 Provide framing to back horizontal gypsum board joints in fire-rated separations where required by applicable ULC or WHI test or OBC Supplemental Standard “SB-2".

3.3
Ceiling Furring

.1 Furring indicated on drawings is schematic. Do not regard as exact or complete.

.2 Erect hangers and runner channels for suspended gypsum board ceilings to CSA A82.30-M1980 except where specified otherwise.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150mm of each corner and at max. 600mm around perimeter of fixture.

.4 Install work level to tolerance of 1:1200.

.5 Install 19 x 64mm furring channels parallel to, and at exact locations of ceiling height steel stud partition header track.

.6 Erect drywall furring channels transversely across suspended runner channels at 400mm o.c., and secure with triple wire ties or special clips. Install furring channels within 150mm of boundary walls and interruptions of continuity. Keep furring

25mm from walls, penetrations.

.7 Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles and other penetrations.

.8 Furr for gypsum board faced bulkheads within or at termination of or level changes in ceilings.

.9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.10 Brace suspension for exterior soffits and entrance vestibule ceilings to prevent upward movements due to wind pressure.

3.4
Wall Furring

.1 Attach drywall furring channels to masonry and concrete max. 400mm o.c., using hardened nails at 600mm o.c. alternating to opposite flanges. Wrap furring around exterior corners to manufacturer's instructions. Provide furring channels within 100mm of internal corners and where shown on drawings.

.2 Frame openings and around built-in equipment, cabinets, access panels, etc., on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.3 Construct bulkheads and box in ducts, beams, columns, pipes, and exposed services.

.4 Install wall furring to tolerance of 1:1000. Shim as required.

3.5
Gypsum Board
Application, General

.1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work is reviewed by Consultant.

.2 Apply layers of gypsum board to furring or framing using screw fasteners. Max. spacing of screws; generally 300mm o.c. on edges and 400mm o.c. in field, but 150mm o.c. for cement board, 200mm o.c. for gypsum sheathing and as additionally required by fire-rated assemblies.

.3 Offset vertical and horizontal joints between layers of gypsum board.

.4 Run long axis of gypsum board for ceilings perpendicular to furring with end joints staggered.

.5 Run long axis of gypsum board for walls vertically.

.6 Offset board joints on opposite sides of partitions.

.7 Apply gypsum sheathing horizontally.

.8 Install acoustic insulation in partitions where indicated.

.9 Apply acoustic caulking to acoustically insulated walls where noted.

.10 Use moisture resistant gypsum board where ceramic tile finish not indicated on walls of washrooms and within 1.0m of plumbing fixtures. Do not use moisture resistant gypsum board on ceilings.

.11 Extend gypsum board on walls and partitions to deck above except as otherwise noted.

.12 Extend gypsum board covering exterior wall studs to structure above.

.13 Use moisture resistant gypsum board where ceramic tile to be adhered to walls.

.14 Do not screw gypsum board to top tracks of double top tracked stud walls .

.15 At abutting interior partitions, extend gypsum board continuously across inside face of exterior walls.

3.6
Gypsum Board
Applications to
Fire Separations

.1 Extend all gypsum board for fire separation partitions to deck above. Shape gypsum board to suit deck profile. Box-in interfering joists, beams, pipes and conduits to maintain fire separation.

.2 Line fire damper openings in fire-rated partitions with fire-rated gypsum board.

.3 Carry one layer of gypsum board across full width and depth

of head of fire-rated frames.

.4 Carry column fire proofing to top of columns without horizontal joints.

.5 Carry gypsum board ceiling fire protection continuously across head of drywall partitions.

.6 At abutting non-rated partitions, extend gypsum board of fire rated assemblies continuously across face of fire rated assembly.

3.8
Taping & Filling

.1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces. Use Durabond 90 to fill exterior ceiling board joints.

.2 Finish corner beads, casing beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

.6 For moisture resistant gypsum board behind ceramic tile: Use Durabond 45 or 90 joint compound. At unfilled cut joints, edges and cutouts seal with shellac. Caulk penetrations with sealant.

.7 Tape and fill all joints of gypsum board covering plastic insulation.

.8 Tape and fill all joints of gypsum board face layer in fire separations and assemblies, in acoustic walls, on exterior walls and behind ceramic tile.

3.9
Accessories

.1 Erect accessories straight, plumb, level, true and rigid at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned, and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150mm o.c.

.2 Install metal corner beads on external angles.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.

3.10
Fire-Rated Assemblies

.1 Construct fire-rated assemblies where indicated. Conform to “Ontario Building Code Supplementary Standard SB-2" or, where ULC or WHI design indicated, conform to the design indicated.

.2 Post ULC, WHI and O.B.M.E.C. design descriptions with building permit.

3.11
Control Joints

.1 Construct control joints set in gypsum board facing and supported independently on separate furring and framing on both sides of joint.

.2 Provide continuous polyethylene dust barrier behind and across control joints.

.3 Locate control joints where indicated, at changes in substrate construction, at approximate 10m spacing on long walls and ceilings. Obtain Consultant's approval of proposed locations prior to installation.

.4 Install control joints straight and true.

3.12
Access Doors

.1 Install access doors to electrical or mechanical fixtures as specified in respective sections.

.2 Rigidly secure frames to furring or framing systems.

.3 Obtain Consultant's prior approval of exact location.

3.13
Batt Acoustic Insulation

.1 Wedge acoustic blanket in all voids in designated partitions. Pack all gaps in blanket with additional mineral fibre material so that the entire wall is covered. Pack around built-in fitments, electrical outlets, door and window frames, grilles, etc., to ensure that there are no gaps.

.2 Where blanket does not fill entire thickness of cavity, attach acoustic blankets to wall board with staples and washers as follows:
.1 For batts over 51mm thick, at top corner of each batt, 50mm in from edges.
.2 For batts under 51mm thick, at 400mm o.c.

.3 All insulation to be reviewed by Consultant prior to covering up.

.4 Pack gaps at top of insulated partitions which are not rated, nor fire separations, with glass fibre insulation for full wall thickness.

.5 Use only ULC or WHI labelled batts in fire-rated partitions.

3.15
Roof Top Unit Curbs

.1 Where indicated on architectural or mechanical drawings, provide cement board and insulation across area inside roof curbs. Use semi-rigid mineral fibre insulation meeting standards of Section 07 21 00. Caulk perimeters, joints, and penetrations of each layer of cement board.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Concrete Tolerances: Division 03

.2 Toilet and Bath Accessories: Section 10 28 00

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Reference Standards

.1 Do work to “Specification Guide 09300 Tile Installation Manual 2006-2007” produced by Terrazzo Tile and Marble Association of Canada, and the American National Standard "Specifications for the Installation of Ceramic Tile, 1992" except where specified otherwise.

1.4 Maintenance Data

.1 Provide maintenance data for tile work for incorporation into Maintenance Manual as per Section 01 30 00.

1.5 Maintenance Material

.1 Provide maintenance materials in accordance with Section 01 30 00.

.2 Provide min. 1% of each type and colour of tile required for project for maintenance use.

.3 Maintenance material to be of same production run as installed material.

1.6 Environmental Conditions

.1 Maintain temperatures of air and substrate over 12°C or 48 hours before during, and after installation.

1.7 Protection and Cleaning

.1 Keep all traffic off floors for a minimum of 48 hours.

.2 Protect wall from impact and vibration until fully set. Protect

adjacent work.

.3 Immediately prior to the formal acceptance of the building, inspect work and repair all damages and defects, clean the tile work.

PART 2 - PRODUCTS

2.1
Tile Materials

.1 Quarry tile: Olympia Omnia Series, 305 x 305mm, structured and smooth finish, 3 colours.

.2 Ceramic wall tile : Olympia Maple Leaf Series, 100mm x 400mm., 3 colours.

.3 Variation in colour, texture, and other visual characteristics of tile shall be imperceptible.

2.2
Mortar and
Adhesive Materials

.1 Portland cement: To CAN3-A5-M89, Type 10.

.2 Sand: To CSA A82.56M-1976, white silica sand for pointing.

.3 Hydrated lime: To ASTM C207-79 (1984).

.4 Latex additive: Formulated for use in Portland cement mortar and thin set bond coat.

.5 Water: Potable and free of minerals which are detrimental to mortar and grout mixes.

.6 Dry set mortar: To ANSI A118.1-1992.

.7 Latex - Portland cement bond coat: To ANSI A118.4-1992.

2.3
Grout

.1 Dry curing wall grout: To ANSI A118.1-1992.

.2 Colour: Refer to Room Finish Schedule for selections.

.3 Grout preparation: To manufacturer's instructions.

2.4
Accessories

.1 Divider strips: 2mm thick zinc, depth equal to height of finish above slab.

.2 Edge Strips: Schluter “Schiene” AE finish.

.3 Reducer Strips: Schluter “Reno”, AE finish.

.4 Stair nosing: Schluter. TREP-T-MT/TL.

2.5
Mortar and
Adhesive Mixes

.1 Leveling coat: 1 part cement, 4 parts sand, 1 part water including min. 10% latex additive.

.2 Mortar bed for floors: 1 part cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.

.3 Measure mortar ingredients by volume.

.4 Dry set mortar: Mix to manufacturer's instructions.

PART 3 - EXECUTION

3.1
Workmanship

.1 Examine work upon which this work depends including evenness of substrate.

.2 Apply tile and backing coats to clean dirt free surface, free of matter likely to impair adhesion.

.3 Fit tiles around corners, fitments, fixtures, drains, and other built-in objects. Maintain uniform joint appearance. Cut edges smooth, even, and free from chipping. Edges resulting from splitting not acceptable.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform, plumb, straight, true, even, and with adjacent tile flush. Ensure sheet layout not visible after installation. Make joints 1.5mm wide for tile 115mm or less, 3mm for 150mm tile, 4mm for 200-250mm tile, 6mm for

300-400mm.

.6 Align patterns. Patterns to be uninterrupted through doorways.

.7 Lay out tiles so perimeter tiles are min. ½ size.

.8 Make internal angles square, external angles bullnosed. Use bullnose base where no tile finish above. Cut porcelain tile to provide quarry tile base and bevel top edge minimum half thickness.

.9 At termination of wall tile panels, except where panel butts projecting surface of differing plane:
- .1 Use edge strips at terminations.
- .2 Bevel edges of porcelain tile min. half thickness for use as base.

.10 Install edge or reducer strips at junction of tile flooring and dissimilar materials.

.11 Sort and arrange tiles to ensure no apparent variation in colour texture between panels.

.12 Sound tile after setting. Replace hollow backed tile.

.13 Allow min. 24h after installation of tiles before grouting where tile set in mortar bed.

.14 Joints to be watertight without voids or cracks.

.15 Remove as work progresses all excess foreign matter which would set up or become difficult to remove from finished surfaces.

.16 Keep building expansion joints free of mortar or grout.

.17 Provide control joints at max. 6.0m in each direction in approved locations. Make joint width same as tile joints. Fill control joints with sealant in accordance with Section 07 92 00. Provide expansion space not less than joint width where tile abuts walls, columns and other vertical elements. Provide divider strip each side of control joints.

.18 Damp cure latex cement mortars and grouts min. 72 hours.

3.2
Application of Wall Tile

.1 Use dry set mortar over masonry and concrete.
.1 Apply slight levelling coat to masonry and concrete where necessary.
.2 Apply bond coat 4 to 6mm thick to backing.

.2 Press tile firmly into bed and beat each tile into position to obtain 60% bond coat coverage to each unit. Do not slide into place.

.3 Remove any facing paper within one hour and clean joints of dust, dirt and excessive setting mortar. Take care not to damage the surface.

.4 Grout all joints with dry set grout. Force grout into joints. Remove excess grout.

.5 As soon as grout has reached its initial set, wipe tiles with sponge and polish with clean dry cloth.

3.3
Setting Floor Tile

.1 Apply slight levelling coat to concrete where necessary.

.2 Use latex Portland cement mortar in vestibules and lobbies.

.3 Apply 6mm dry set bond coat using formula for ceramic tile floors except:
.1 Use latex Portland cement bond coat in vestibules and lobbies.

.4 Press tile into mortar bed and beat firmly into position, insuring maximum contact with mortar bed.

.5 Brush spacing mix into all joints. Sponge off and make final adjustments.

.6 Apply grouting paste, forcing into joints. Use same colour as spacing mix.

.7 As soon as grout has reached its initial set, wipe tiles with sponge and polish with clean, dry cloth.

3.5
Cleaning

.1 Thoroughly clean down all work immediately after joint pointing is set hard, to the satisfaction of the Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Mechanical and Electrical Fixtures: Division 23 and Division 26

.2 Supplementary Light Support Chains: Division 26

1.2 General

.1 The requirements of Division 01 form part of this section.

1.3 Reference

.1 ASTM-C635-04 Specifications for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

.2 ASTM C636-04 Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

.3 CAN/CGSB 92.1-M89 Acoustical Units, Prefabricated.

1.4 Design Criteria

.1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

1.5 Samples

.1 Submit duplicate samples of acoustical units in accordance with Section 01 30 00.

1.6 Environmental Conditions

.1 Commence installation after building enclosed and dust generating activities completed.

.2 Permit wet work to dry prior to commencement of installation.

.3 Maintain uniform minimum temperature of 15 degrees celsius and humidity of 20 - 40% before, during and after, installation.

.4 Store material in work area 48h prior to installation.

1.7
Maintenance Materials

.1 Provide maintenance materials in accordance with Section 01 30 00.

.2 Provide acoustical units amounting to at least 2% of gross ceiling area for each pattern and type required for project. Provide in packages sealed as received from manufacturer.

.3 Materials to be same production run as installed materials.

1.8
Certification

.1 Loading capacity of ceilings to meet requirements of O.H.E.P.C. and referenced ASTM standards. Provide certificate of same signed by both manufacturer and installer if required by Consultant. General Contractor to countersign.

.2 Light support chains are specified in Division 26.

.3 Provide seismic review letter stamped by an Ontario P. Eng. confirming compliance with OBC seismic requirements for all suspended ceiling systems and bulkheads.

PART 2 - PRODUCTS

2.1
Suspension System for
Acoustical Ceilings

.1 Heavy duty systems to ASTM C635.

.2 Basic Material: Commercial quality cold rolled steel, zinc coated, min. 0.50mm core thickness.

.3 Suspension Systems:
.1 LIT (Typical): Two directional exposed tee bar grid, non-fire rated, heavy duty fire rated where noted.
.2 LIT-F : Fire-resistance rated suspension system: Two directional exposed tee bar grid, certified for use in 3/4 hour two directional exposed tee bar grid, floor/ceiling assembly ULC I 211.

.4 Exposed tee bar grid components: Shop painted satin sheen, white. Components die cut. 25mm exposed face. Main tee with double web, rectangular bulb and rolled cap on exposed face. Cross tee: with rectangular bulb; web

extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.

.5 Hangers Wire: Galvanized soft annealed steel wire; to ULC design requirements for fire rated assemblies, otherwise 2.6mm diameter (12ga.)

.6 Hanger Inserts: Purpose made.

.7 Carrying channels: Min. 38 x 19mm channels, min. 1.2mm core thickness, galvanized steel.

.8 Accessories: Splices, clips, wire ties retainers and wall mouldings to complement suspension system components and as recommended by system manufacturer.

2.2
Lay-in Acoustical Panels

.1 Type LIT1: To CAN/CGSB 92.1; Type D (mineral), medium scale non-directional fissured pattern, flame spread rating of 25 or less, smoke developed 50 or less, NRC 0.50-0.60 min., LR min. 0.75, CAC 35 min., square edge, white, flat and
610 x 610 x 16mm as indicated. Manufacture: CGC Mars Climaplus or equivalent.

.2 Type LIT-2 (Fire-Rated): Fire resistance rated, certified for use in 3/4 hour floor/ceiling assembly ULC I 211.

PART 3 - EXECUTION

3.1
Grid Installation

.1 Installation: In accordance with ASTM C636 except where specified otherwise.

.2 Install suspension system to manufacturer's instructions.

.3 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Consultant.

.4 Secure hangers securely to overhead steel structure (but not to steel roof deck). Use attachment methods acceptable to Consultant.

.5 Support suspension system main tees at maximum 1220mm o.c. and within 150mm from ends of main tees.

.6 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter, with border units not less than 50% of standard unit width, or according to reflected ceiling plan.

.7 Arrange grids so ends of recessed fluorescent fixtures and linear diffusers rest on main tees.

.8 Ensure suspension system is co-ordinated with location of related components.

.9 Hang ceilings independent of walls, columns, fascias, ducts, pipe and conduit. Tie off ends of cross tees.

.10 Install wall mould to provide correct ceiling height.

.11 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.

.12 Interlock cross member to main runner to provide rigid assembly.

.13 Frame at openings for light fixtures, air diffusers, speakers, valences, louvres, at changes in ceiling heights, and at perimeter of installation.

.14 Provide pairs of cold rolled carrying channels nested together and tied with hanger wire from structure where required to supplement structural layout and at interferences.

.15 Install grid straight, square, continuous and parallel to building lines.

.16 Finished ceiling system to be level within 1:1000.

.17 Use basket weave installation for 610 x 610 grids.

3.2
Panel Installation

.1 Do not install acoustic panels until painting is mostly complete in the building.

.2 Do not install acoustic panels until the grid and the work above ceiling have been reviewed by Consultant.

.3 Co-ordinate ceiling work to accommodate components of other sections such as light fixtures, diffusers, detectors, speakers, sprinkler heads, to be built into ceiling components.

.4 Install acoustic panels into ceiling suspension system.

.5 Maintain directional pattern running in same direction.

.6 Scribe acoustic units to fit adjacent work and cut holes in tiles to suit all ceiling fixtures.

3.3
Fire-Rated Ceilings

.1 Provide fire-rated assemblies incorporating fire-rated suspension system and fire-rated acoustic panels in accordance with reference ULC design requirements.

.2 Secure lay-in panels with hold down clips.

.3 Incorporate an expansion joint in each installed 3660mm length, or less, of main tee. Use fire-rated splices.

.4 Box in recessed light fixtures, diffusers, air return grilles, and other appurtenances with acoustic panels.

.5 Install colour flagged pins at locations of valves dampers, pull boxes and other items requiring access. Colour code and install in consultation with Consultant. Similarly, identify last tile installed in each room.

3.4
Existing Ceilings

.1 Carefully remove and install existing grid as required to do work of this project. Replace grid components damaged prior to or during construction with undamaged components salvaged from demolition.

3.5
Cleaning Existing Grid

.1 Clean grid, trim and edge mouldings, which are to remain. Remove dirt, grime, and adhesive tape. Use mild, non-abrasive cleaner and applicators with minimal water but sufficient “elbow grease”. Damp rinse away cleaner.

3.6
Cleaning

.1 Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.7
Finished Ceiling

.1 Finished ceiling shall present a smooth, flush, even, level, continuous surface at elevations called for on the drawings, without perceptible sag, distortion, warp, or surface defects. Warped, soiled or otherwise defective panels shall be removed and replaced with new panels to the satisfaction of the Consultant and at no cost to the Owner. Exposed grid shall be straight, square, continuous and parallel to building lines.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work .1 Electrical Fixtures: Division 26

1.2
General .1 The requirements of Division 01 form part of this section.

PART 2 - PRODUCTS

2.1
Materials .1 Linear Strips: 17mm deep channel shaped strips of 0.63mm Aluminum complete with integral male and female interlocking
edges to produce flush surface.
.1 Square edges, plain faced, unperforated, 100mm module.
.2 Two coat baked enamel finish to CGSB 93- GP - 1a on Exposed side, 0.02mm thick. Matte finish.
.3 Colour: 'Gun Metal Grey'
.4 Provide recessed reveal filler strips
.5 Manufacture: Metalworks Linear by Armstrong Industries.

.2 Carriers: Manufacturer's standard carriers with integral clips for snap-on installation of soffit panels. Black baked enamel finish. Min. 1.0mm thick aluminum. .

.3 Furring and hanging channels: 38 x 13 x 1.6mm galvanized steel to CSA A82.30-M1980.

.4 Accessories: Concealed splices, carrier splices clips, all in matching colour.

.5 Isolation Coating: Alkali resistant heavy bodied bituminous paint or methacrylate type lacquer conforming to CGSB 1-GP-108 and 159a respectively.

PART 3 - EXECUTION

3.1
Workmanship .1 Finished soffit to be an even flat plane, with maximum

deflection of 1/360 of span, at elevation called for on drawings, without sag or distortion. Panels to be straight, continuous and parallel to building lines, without warp, dents, scratches or any other surface defects.

3.2
Erection

.1 Do not erect ceiling until mechanical and electrical work above ceiling has been approved by Consultant.

.2 Install linear ceiling system to manufacturer's directions to provide rigid assembly, capable of withstanding wind loads of 140 kph without damage.

.3 Lay out panels in direction indicated. Provide balanced borders at perimeter. Fit recessed fixtures symmetrically into soffit module.

.4 Locate soffit carriers at max 600mm o.c. and max. 75mm from ends of linear strips.

.5 Mechanically fasten (do not tie) carriers to furring channels at 600mm o.c. and max. 75mm from ends of carriers. Support furring channels from structure with furring channels at max. 1200mm o.c. and max. 200mm from ends. Mechanically fasten (do not tie) or weld to furring.

.6 Attach each strip to at least three furring channels. Make provision for thermal movement.

.7 Support light fixtures with supplemental furring channels.

.8 Provide approved trim at all perimeters and interruptions in soffit.

.9 Use only concealed type fasteners for all work.

.10 Paint aluminum surfaces to be in contact with wood, concrete or dissimilar materials with isolation coating.

.11 Each strip and each carrier to be single member. No splices permitted.

END OF SECTION

PART 1 - GENERAL

1.1
Related Sections

.1 Read carefully all other Sections of the specifications to determine the extent of the prime and the finish coats applied by others including:
- .1 Pavement Markings: Division 32
- .2 Shop Priming of Structural Steel and Metal Fabrications: Division 05
- .3 Factory Finishing of Cabinetry: Section 06 20 00
- .4 See Divisions 21,22, and 23 (Mechanical) and Division 26 Electrical, and co-ordinate painting of those Divisions.
- .5 Painting Gas Lines on roof, in service rooms, and where concealed Division 22

1.2
General

.1 The requirements of Division 01 form part of this section.

.2 Provide alternative price to paint existing metal siding.

1.3
References

.1 Canadian Painting Contractors' Architectural (CPCA).
- .1 Painting Specification Manual 2000.

.2 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB 1.100-99, Interior Latex Type, Flat Paint.
- .2 CAN/CGSB 1.118-95, Interior Alkyd, Flat Finish.
- .3 CAN/CGSB 1.119-2000, Primer-Sealer, Wall, Interior Latex Type.
- .4 CAN/CGSB 1.146-99, Cold Curing, Gloss Epoxy Coating.
- .5 CAN/CGSB 1.150-M91, Clear Lacquer for Wood Furniture.
- .6 CGSB 1-GP-171-98 Coating, Inorganic Zinc.
- .7 CAN/CGSB 1.175-97, Polyurethane Interior Coating, Oil Modified, Clear, Gloss and Satin.
- .8 CAN/CGSB 1.181-99 Ready-Mixed Organic Zinc-Rich Coating
- .9 CAN/CGSB 1.195-99, Interior Semi-gloss Latex Paint.
- .10 CAN/CGSB 1.198-2001, Cementitious Primer (for Galvanized Surfaces).
- .11 CGSB 1.213-2004 Etch Primer (Pretreatment Coating

or Tie Coat) for Steel and Aluminum.
.12 CAN/CGSB 85.10-99, Protective Coatings for Metals.
.13 CAN/CGSB 85.100-93, Painting.

.3 Ontario Fire Code 2015.

.4 Steel Structures Painting Council (SSPC).
.1 Systems and Specifications Manual 1989.

1.4
Product Data

.1 Submit product data in accordance with Section 01 30 00.

.2 Submit full information for all products proposed for use. List each product in relation to finish formula and include the following:
.1 Finish formula designation.
.2 Product type and use.
.3 CGSB number.
.4 Manufacturer's product number.
.5 Colour numbers.
.6 Manufacturer's specification sheets.
.7 Manufacturer's Material Safety Data Sheets (MSDS).
.8 Maximum VOC classification.

.3 Submit manufacturer's application instructions for each product specified.

1.5
Samples

.1 Paint colours will be chosen from an approved manufacturer listed in Article 2.1.

.2 Submit name of proposed paint manufacturer.

.3 Submit duplicate 350cm^2 samples of each selected paint colour on 8½" x 11" white cardstock for approval. Submit exact colour formula if paint is other than manufacturer's colour chosen.

.4 Submit duplicate sample panels of clear finishes on samples of wood trim and plywood to be used on project.

.5 Submit in accordance with Section 01 30 00.

1.6
Quality Assurance

.1 Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet requirements of the specifications. Produce documents when requested by Consultant.

1.7
Standard of Acceptance

.1 Walls. No defects visible from a distance of 1000mm at 90° to surface.

.2 Ceilings. No defects visible from floor at 45° to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.8
Delivery Storage and Handling

.1 Deliver and store materials in original containers, sealed, with labels intact.

.2 Indicate on containers or wrappings:
.1 Manufacturer's name and address.
.2 Type of paint.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Storage:
.1 Provide and maintain dry, temperature controlled, secure storage.
.2 Observe manufacturer's recommendations for storage and handling.
.3 Store materials and supplies away from heat generating devices.
.4 Store materials and equipment in a well ventilated area with temperature range 7° to 30°C.
.5 Store temperature sensitive products within temperature range as recommended by manufacturer.
.6 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant.

.7 Remove materials only in quantities required for same day use.

.5 Provide minimum one 9 kg, Type ABC dry chemical fire extinguisher adjacent to storage area.

.6 Fire Safety Requirements
.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the Ontario Fire Code.

1.9 Environmental Requirements

.1 Except where specific products specified, paint, primer and undercoating materials shall meet limitations and restrictions concerning chemical components of the following standards.
.1 Topcoat Paints:
Green Seal Standard GS-11, May 2008.
.2 Anti-Corrosive and Anti-Rust Paints - Green Seal Standard GS-3, January 1997.
.3 South Coast Air Quality Management District Rule 1113, Architectural Coatings, July 2007.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials

.3 Ventilation:
.1 Ventilate area of work by use of approved portable supply and exhaust fans.
.2 Ventilate enclosed spaces in accordance with Section 01 50 00.
.3 Provide continuous ventilation during and after application of paint. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of application of paint.

.4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturers recommendations.

.5 Substrate and ambient temperature must be within limits

prescribed in paint standard and by manufacturer to approval of Consultant.

.6 Maintain minimum substrate and ambient air temperature of 10°C. Maximum relative humidity 85%. Maintain supplemental heating until paint has cured sufficiently.

.7 Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.

.8 Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface.

.9 Apply paint only when surface to be painted is dry, properly cured and adequately prepared.

.10 Painting in occupied facilities to be carried out during unoccupied hours only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.

.11 Where exterior surface to be painted is not under cover, do not apply paint when:
.1 Substrate and ambient air temperature is below 5°C for alkyd and 7°C for latex paints or when temperature is expected to drop to 0°C before paint has thoroughly cured.
.2 Substrate and ambient air temperature are expected to fall outside limits prescribed in paint standard and by manufacturer.
.3 Temperature of surface is over 50°C unless paint is specifically formulated for application at high temperatures.
.4 Rain or snow are forecast to occur before paint has thoroughly cured; it is foggy, misty, raining or snowing at site; relative humidity is above 85%.
.5 Surface to be painted is wet, damp or frosted.
.6 Previous coat is not dry.

.12 Provide and maintain cover when exterior paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.13 Apply exterior paint finish only when dust is no longer being

generated by related construction operations or when wind conditions are such that airborne particles will not affect the quality of the finished surface.

.14 Schedule exterior painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.15 Remove exterior paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

PART 2 - PRODUCTS

2.1
Materials

.1 Approved manufacturers are:
- .1 Benjamin Moore
- .2 I.C.I. (Glidden, Devoe)
- .3 Para
- .4 Pittsburgh
- .5 Pratt & Lambert
- .6 Sherwin Williams
- .7 Sico

.2 Generally use the products of only one manufacturer on the project.

.3 Use manufacturer's "Top-Line" products only. Use only products which meet or exceed CGSB Specifications references, except for specially mentioned materials or manufacturers.

.4 Paint materials for each coating formula to be products of a single manufacturer.

.5 Low odour products. Whenever possible, select interior products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour.

.6 Use VOC complying materials for interior work.

2.2
Colours

.1 Consultant will provide Colour Schedule after contract award.

.2 Selection of colours will be from manufacturers full range of colours.

.3 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

.4 Perform all colour tinting operations prior to delivery of paint to site.

.5 Each coat of paint shall be slightly darker than preceding coat unless otherwise approved.

2.3
Gloss

.1 Gloss terms shall have the following values:

Gloss Term	Gloss Value @ 60°	Gloss Value @ 85°
Flat (or Matte)	0-5	max. 10
Eggshell (or Velvet, Low Lustre)	5-25	min. 10
Satin	20-35	
Semi-Gloss	35-65	
Gloss, medium	65-80	
Gloss, high	80 +	

2.4
Interior
Paint Finishes

.1 Numbers after paint description are the required CAN/CGSB-1 Series standards to be met.

.2 “100% Acrylic Paint”: means Sherwin-Williams Satin-Plex 1000 / Lustre-Plex 2000, ICI/Devoe Life Master-Pro 4216 (gloss only) or approved equal.

.3 Gypsum Board and Plaster:
.1 One coat latex primer-sealer: 119.
.2 Two coats: “100% Acrylic”.

.4 Concrete Floors (sealed):
.1 Two coats high solids, water emulsion acrylic sealer: Sealtight Vocomp30.

.5 Ferrous Metal (exposed structural steel):

.1 Touch up shop primer with primer as provided by fabricator.
.2 One coat acrylic metal primer: 61.
.3 Two coats “100% Acrylic”.

.6 Ferrous Metal (Water Based Epoxy) (railings, balustrades and stairs):
To CPCA System INT-12-G.
.1 Touch up shop primer with same primer as provided by fabricator.
.2 One coat rust inhibitive primer.
.3 Two coats water based catalyzed epoxy.

.7 Wipe Coat Galvanized Metal (Epoxy) (doors and frames):
.1 Touch up shop primer with same primer as provided by fabricator.
.2 Two coats water based catalyzed epoxy.

.8 Galvanized and Zinc Coated Metal
.1 One coat vinyl wash primer: 213
.2 Two coats “100% Acrylic”.

.9 Wipe Coat Galvanized Metal (deck, doors & frames):
.1 Touch up with zinc rich primer: 181.
.2 One coat acrylic metal primer.
.3 Two coats: “100% Acrylic”.

.10 Wood (Painted):
.1 Spot prime knots and resinous areas.
.2 One coat enamel undercoat: 38.
.3 Two coats: “100% Acrylic”.

.11 Copper Piping and Fittings:
.1 One coat vinyl wash primer: 213
.2 Two coats alkyd: 118, 202, 57, 60.

.12 Cotton or Canvas Insulation Coverings:
.1 One coat latex primer-sealer: 119.
.2 Two coats alkyd 118, 202, 57, 60.

.13 Electrical Backboards:
.1 One coat Ocean Chemicals #987 intumescent fire retardant paint.

2.5
Exterior
Paint Finishes

.1 Ferrous Metal: Structural Steel at Entrance
- .1 Touch up shop primer with same zinc rich primer as provided by fabricator: 171, 181.
- .2 One coat high build epoxy primer.
- .3 One coat aliphatic polyurethane enamel.
- .4 Standard of Acceptance:
  - .1 SW: Tile Clad II/B65-B60V2.
  - .2 Devoe: Devran 4170/Devthane 389.

.2 Ferrous Metal: Other
- .1 Touch up shop primer with same zinc rich primer as provided by fabricator: 171, 181.
- .2 One coat acrylic primer.
- .3 Two coats high performance acrylic: Glidden 6900 or Sherwin William DTM B66.

.3 Galvanized and Zinc Coated Metal:
- .1 One coat cementitous primer: 198.
- .2 Two coats alkyd: 135, 59.

2.6
Gloss Schedule

.1 The following are generally intended:

- ceilings	flat
- walls	eggshell
- corridor walls	semi-gloss
- walls of service areas (incl. washrooms, mechanical, electrical, multipurpose, storage and janitor rooms)	semi-gloss
- doors & frames - painted	semi-gloss
- doors - varnished	satin
- millwork and cabinetry - painted	semi-gloss
- millwork and cabinetry - varnished	satin
- metalwork	medium gloss

.2 Select paint products to provide infield gloss levels specified in Article 2.3. Darker colours may require higher gloss designation product.

PART 3 - EXECUTION

3.1
General

.1 Perform all preparation, painting and finishing operations in accordance with:

.1 CAN/CGSB-85.100 and other CGSB-85-GP series standards except where specified otherwise.
.2 CPCA Painting Specification Manual except where specified otherwise.

.2 Apply all paint materials in accordance with paint manufacturers written application instructions.

3.2
Preparation

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and all other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

.2 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of Consultant.

.3 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

3.3
Protection

.1 Protect building surfaces not to be painted from paint spatters, markings and other damage. If damaged, clean and restore or replace such surfaces as directed by Consultant.

.2 Cover or mask floors, windows and other ornamental hardware and other surfaces and items not being painted adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

.3 Protect items that are permanently attached such as Fire Labels on doors and frames.

.4 Protect factory finished products and equipment.

3.4
Substrate
Conditions

.1 Investigate substrates for problems related to proper and

complete preparation of surfaces to be painted. Report to Consultant all damage, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Investigate moisture content of surfaces to be painted and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:
.1 Plaster and wallboard: 12%.
.2 Masonry/Concrete: 12%.
.3 Concrete Block/Brick: 12%.
.4 Wood: 15%.

3.5
Cleaning

.1 Clean all surfaces to be painted.
.1 Remove all dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths. Use compressed air to clean out areas inaccessible by vacuuming and wiping.

.2 Wash surfaces with solution of T.S.P. and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

3.6
Surface
Preparation

.1 Prepare surfaces as recommended by CPCA, paint manufacturer, and as specified herein.

.2 Sand existing surfaces with intact, smooth, high to semi-gloss coatings. Thoroughly sand all existing alkyd paint

before over coating with latex paints. Provide adequate adhesion for new finishes.

.1 Full heavy sanding required for doors, frames, stairs, railings, and other high abrasion areas.

.2 Light sand and conversion coating, or full heavy sanding required elsewhere.

.3 Prepare new concrete floor by acid etching. Rinse with clean water and thoroughly dry.

.4 Plaster and Wall Board:

.1 Ensure joints in wallboard are properly filled and sanded smooth.

.2 Fill small nicks and holes with patching compound, sand smooth and spot prime

3.7
Surface Preparation - Metal

.1 Clean metal surfaces to be painted by: removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with the following:

.1 Solvent cleaning: SSPC-SP-1followed by

.2 Hand tool cleaning: SSPC-SP-2 and

.3 Power tool cleaning: SSPC-SP-3 if necessary.

.2 Remove traces of blast products and other foreign substances from surfaces, pockets and corners to be painted. Brush with clean brushes, blow with clean dry compressed air, or vacuum clean as necessary.

.3 Touch up shop primer to CGSB 85-GP-10M with primer as specified in applicable section. Touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.

3.8
Mixing Paint

.1 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

.2 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer.

3.9
Application

.1 Method of application to be as approved by Consultant. Apply paint by brush or roller. Hand brush wood surfaces. Spraying will not be permitted without written permission. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush application.
.1 Work paint into cracks, crevices and corners. Paint surfaces not accessible to brushes by spray, daubers or sheepskins.
.2 Brush out runs and sags.

.3 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application.
.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
.4 Brush out immediately all runs and sags.
.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.

.5 Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between each coat to remove visible defects and achieve an anchor for subsequent coat.

.8 Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.

.9 Finish inside of cupboards and cabinets as specified for outside surfaces. Varnish inside of drawers.

.10 Finish closets and alcoves as specified for adjoining rooms.

.11 Finish top, bottom, edges and cutouts of wood doors after fitting as specified for door surfaces.

.12 For deep colours and high contrast accent colours, include one additional finish coat.

.13 Where repainting over deep colours, include one additional finish coat.

.14 Finishes and number of coats specified in the Schedule are intended to cover surfaces completely. If they do not, apply further coats until complete coverage is achieved as required.

.15 Any areas exhibiting incomplete or unsatisfactory coverage shall have the entire plane painted. Patching will not be acceptable.

.16 Prime wood doors. Paint tops, bottoms and cutouts of wood doors the same as faces.

.17 Apply primer coats to ferrous metal surfaces that have not received a shop coat of primer.

.18 Paint shall be uniform in sheen, colour and texture, free from brush or roller marks, sags, runs or other defects.

3.10
Mechanical
Electrical
Equipment

.1 Read mechanical and electrical sections for the extent of painting work to be done under those sections.

.2 In finished areas and on exterior : Paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment. Colour and texture to match adjacent surfaces, except as noted otherwise.

.3 In finished areas: Finish paint primed mechanical equipment. Finish paint hydronic heating cabinets, and the like.

.4 In mechanical and electrical and unfinished areas: Leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.5 Remove grilles, covers, access panels for mechanical and electrical systems from installed location and paint separately if these items are not factory finished.

.6 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.7 Do not paint over nameplates.

.8 Keep sprinkler heads free of paint.

.9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.10 Paint natural gas piping:
.1 On exterior of building: Roof: yellow, other: Colours as selected.
.2 In mechanical, service and storage rooms: safety yellow.
.3 Exposed elsewhere inside building: To match adjacent surfaces.

.11 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.12 Do not paint outdoor transformers.

3.11
Finish Schedule

.1 Finish the listed exposed surfaces, as indicated on Room Finish Schedule, as listed under Article 2.4, Paint Finishes, and as described in Part 3 of this specification.

.2 In instances where materials specified are not suitable for a particular job application or are contrary to manufacturer's

recommendations for use on a particular surface, such condition shall immediately be brought to the attention of the Consultant for clarification and instructions.

.3 Paint or finish all exposed paintable surfaces except surfaces noted as unpainted on Room Finish Schedule or prefinished by other sections. Consult Architect before painting any surface not included in listed schedule.

.4 Do not paint baked enamel, chrome plated, stainless steel, aluminum or other surfaces finished with a final factory finish. All primed surfaces shall be finish painted under this section.

3.12
Restoration

.1 Clean and re-install all hardware fixtures and fittings that were removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.

END OF SECTION

PART 1 - GENERAL

1.1 General

.1 The requirements of Division 01 form part of this section.

1.2 Alternate Manufacturers

.1 Alternate manufacturers will be considered prior to tender closing.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 30 00.

.2 Clearly indicate assembly details and dimensions, required clearances, fastenings, hardware. Indicate size and locations of connections to structure and building services.

.3 Provide description catalogue data.

1.4 Samples

.1 Submit colour samples as per Section 01 30 00.

1.5 Maintenance Data and Installation Instructions

.1 Provide maintenance data for all operating parts for incorporation into maintenance manual specified in Section 01340. Every item to be identified with manufacturer's name and address, model and serial number.

.2 Provide operating instructions.

PART 2 - PRODUCTS

2.1 General

.1 Provide reinforcing and anchorage for built-in products.

.2 Insulate between dissimilar metals to prevent electrolysis.

2.2 Traffic Signs

.1 Traffic Signs:
.1 Supply and install signs to standards of City of Ottawa in quantities indicated.

2.3
Matt Sinkage

.1 Construction Specialties:
.1 “Pedimat” aluminum grille with black vinyl inserts complete with frame and supports. Total assembly 19mm thick. Size: 1220 x 3540.

.2 Isolate surfaces in contact with concrete with two coats of bituminous coating.

2.5
Detectable
Warning Tiles

.1 Manufacturer:
.1 Exterior : DURALAST Detectable warnings, cast iron, natural finish, corrosion resistant, ADA compliant. Cast in place into concrete slab. 600 x 1500mm size.

PART 3 - EXECUTION

3.1
Installation

.1 Erect product in accordance with manufacturer's instructions.

.2 Install work square, plumb, straight, true and securely anchored, and accurately fitted.

.3 Insulate where necessary to prevent electrolysis between dissimilar metals or metal to masonry or concrete.

.4 Adjust operable parts for correct function.

.5 Leave protective coverings in place until final cleaning of building.

END OF SECTION

PART 1 - GENERAL

1.1
Related Work

.1 Not applicable.

1.2
Shop Drawings

.1 Submit shop drawings or catalogue illustrations in accordance with Section 01 30 00.

.2 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 for grab bars.

1.3
Maintenance Data

.1 Provide maintenance data for toilet and both accessories in accordance with Section 01 30 00, for incorporation into maintenance manual.

1.4
Manufacture

.1 Contractor supplied products listed are by Bobrick unless otherwise indicated. Equivalent products by Watrous, Saferail, Frost or Bradley are acceptable.

.2 Products used shall be of a single manufacture.

1.5
Maintenance Materials

.1 Provide special tools required for assembly/disassembly or removal of toilet and both accessories. Provide in accordance with Section 10 21 14.

PART 2 - PRODUCTS

2.1
Materials

.1 Sheet steel: commercial grade, stretcher levelled sheet steel to ASTM A653/A653M-04 with Z275 zinc coating.

.2 Stainless steel sheet: to ASTM A167-99 Type 304 with No. 4 finish, minimum 0.8mm thick.

.3 Stainless steel tubing: AISI Type 304, commercial grade, seamless welded.

.4 Fasteners: screws and bolts hot dip galvanized. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

.5 Fixtures to be constructed of stainless steal except as otherwise noted.

2.2
Finishes

.1 Chrome and nickel plating: to ASTM B456-95 satin finish.

.2 Stainless steel: to AISI No. 4 satin lustre finish.

.3 Manufacturer's or brand names visable on faces of units not acceptable.

2.3
Fixtures

.1 Toilet Tissue Dispensers: B274 (double).

.2 Paper Towel /Waste Dispenser, semi-recessed: B-43944.

.3 Soap Dispensers (wall mounted, vertical): B2111.

.4 Feminine napkin disposal bin: Surface mounted stainless steel: B270.

.5 Grab bars at toilets: 32mm dia. x 1.25mm wall tubing of stainless steel, 76mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2kN.
.1 One 600mm long.
.2 One 760mm x L shaped.

2.4
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 1.5mm 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 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164-M1981.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

PART 3 - EXECUTION

3.1
Installation

.1 Install and secure accessories rigidly in place as follows:
.1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
.2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
.3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
.4 Toilet/shower compartments: use male/female through bolts.

.2 Install grab bars on built-in anchors in drywall partitions.

.3 Use tamper proof screws/bolts for fasteners.

3.2
Location and Quantity

.1 Locate accessories as shown on drawings. Exact locations determined by Consultant.

.2 Dispensing height of accessories in washrooms with handicapped facilities not to exceed 1.2 m above floor.

.3 Provide units as shown on drawings and in the following

min. quantities. Where supplied by Owner; install.

.4 Toilet Tissue Dispensers: one per water closet.

.5 Towel Dispenser: one per lavatory basin.

.6 Soap Dispensers: one per individual lavatory basin and as shown.

.7 Feminine Napkin Disposal Bin: one per female and unisex water closet.

.9 Grab Bar: one of each type at each barrier-free toilet.

END OF SECTION

PART 1 - GENERAL

1.1
General

.1 Cast In Place Concrete — Section 03 30 00

1.2
Design Standards

.1 A660, Certification of Manufacturers of steel building systems.

.2 S16, Design of steel structures.

.3 AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 NRCC. National Building Code of Canada.

.5 CISC/CPMA 2-75, A Quick-Drying Primer for Use on Structural Steel.

.6 CSSBI 30 M Standard for Steel Building Systems.

.7 CSSBI B8 Building Incorporating Steel Building Systems: Responsibility of Parties Involved.

.8 CSSBI B15, Snow, Wind and Earthquake Load Design Criteria for Steel Building Systems.

.9 CSSBI B15A, Structural and Crane Load Design Criteria for Steel Building Systems.

.10 CSSBI S8, Quality and Performance Specification for Prefinished Sheet Used for Building Products.

.11 CSSBI Bulletin No. 9.

.12 W47.1, Certification of Companies for Fusion Welding of Steel.

.13 W59, Welded Steel Construction (Metal Arc Welding).

.14 W48, Filler metals and allied meterials for metal arc welding.

1.3
Product Standards

.1 Plate Coil and Hot-Rolled:
.1 CSA G40.20/G40.21, General requirements for rolled or welded structural quaity steel/ Structural quality steel.
.2 ASTM A529/A529M, High-Strength Carbon-Manganese Steel of Structural Quality.

.3 ASTM A572/A572M, High-Strength Low-Alloy Columbian-Vanadium Structural Steel.
.4 ASTM A653/A653M, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.5 ASTM A792/A792M, Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
.6 ASTM A992/A992M, Steel Structural Shapes.
.7 ASTM A1011/A1011M, Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low-Alloy with Improved Formability and Ultra-High Strength.

1.4
System Description

.1 Type rigid frame or beam and column with vertically braced bays as indicated.

.2 Roof Slope: minimum 1:48 or as indicated on drawings.

.3 Wall System: through fastened or concealed fastener, single skin.

.4 Roof System: fully thermally broken standing seam, concealed fastener, single skin or through fastened roof, single skin.

.5 Stand-Off System: notched zee, hat and chair or metal capped thermal block.

.6 Liner System: through fastened, single skin.

1.5
Design Criteria

.1 Design the steel building system to withstand live loads and dead loads including ceilings, mechanical and electrical systems as indicated.

.2 Design the building walls and roof to allow for thermal movement of component materials caused by ambient temperature range from -40deg C (-40 deg F) to +40 deg C (104 deg F) without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

.3 The building shall be weathertight.

.4 Design the building enclosed components to accommodate, by means of expansion joints and clips, any movement in the component itself and between the component and building structure caused by structural movements without permanent distortion, breakage of seals or water penetration.

.5 Refer to drawings and A660 Certificate of Design and Manufacturing Conformance for additional design criteria.

1.6
Source Quality Control

.1 Provide a certificate that the steel building system manufacturer is certified to CSA-A660, Latest edition.

1.7
Shop Drawings

.1 Submit erection drawings bearing the stamp and signature of a professional engineer registered in the province of Ontario.

.2 Submit the following documents in accordance with the CSSBI 30M paragraph 13; erection drawings showing foundation loads, anchor rod setting details, part numbers, connections and assembly details.

.3 Indicate plans and grid lines, structural members and connection details, bearing and anchorage details, roof cladding, wall cladding, framed openings, camber (as required), loads and reaction forces, fasteners and field welds (as required), sealant locations and details.

.4 Indicate shop and erection details including cuts, copes, connections, holes, threaded fasteners, rivets and welds.

1.8
Certification

.1 Submit A660 Certificate of Design and Manufacturing Conformance stating design criteria used and loads assumed in design. Certificate shall be stamped and signed by a professional engineer registered in the province/state in which the building is to be erected.

.2 Provided documentation to show steel building systems manufacturer is certified under CSA W47.1, Division 1 or 2.1, for welded fabrication.

1.9
Protection- Factory/Site

.1 Protect pre-finished steel sheet during fabrication, transportation, site storage and installation in accordance with CSSBI Bulletin No. 9.

.2 Handle and protect galvalume materials from damage to zinc/aluminum coating. During storage, separate surfaces of galvalume materials to permit free circulation of air.

.3 Provide protection from weather to all primary and secondary steel components if stored on site by means of properly secured tarps. Components should be prevented from prolonged contact to the ground by means of adequately spaced blocking. Ensure that no ponding occurs.

.4 Avoid incurring undue stresses on building components from lifting or twisting during building erection.

1.10
Performance Testing Compliance

.1 Standing Seam Roof System:
.1 Underwriters Laboratories Inc. - U.L. Class 90 rating
.2 Corps of Engineers Uplift Test - ASTM E1592, 156 psf mean ultimate load obtained.
.3 Factory Mutual Research Corporation - FM4477 Uplift Test - 1-60 and 1-90 rating.
.4 ASTM Air and Water Penetration Testing - ASTM E1680 Air Infiltration - ASTM E 1645 Water Leakage.

.2 Through fastened Roof and Wall Systems:
.1 Underwriters Laboratories Inc. - U.L. Class 90 rating.
.2 Diaphragm tests - ASTM E455.

.3 Architectural/ Self-Framing Wall Systems:
.1 Diaphragm testing - ASTM E455.
.2 Compression testing - ASTM E72-98.

1.11
Materials

.1 Primary Structural:
.1 Bar and plate welded sections: to CSA G40.20/G40.21, Type W, ASTM A572/A572M, A529/A529M, A1011/A1011M, HSLAS or SS, 50 ksi (350/345/340 MPa) minimum yield.
.2 Hot rolled beam, angle, channel: to G40.20/G40.21, Type W, ASTM A992M, A572/A572M, A529/A529M, 50ksi (350/345 MPa) minimum yield.
.3 Hot rolled HSS: to G40.20/G40.21, Type W, Class C, 50ksi (350 MPa).
.4 Welded Materials: CSA W48 and W59.
.5 Surface preparation to SSPC-SPa, SP2 or SP3 as required.
.6 Shop Primer Paint: Single Coat Grey Oxide Primer to CISC/CPMA Standard 2-75, 105 to 2 mils film thickness. Standard primer not to exceed 90 days exposure to weather, Hot dip galvanized or epoxy paint available upon request (extra).
.7 Bolts: ASTM A325M (ASTM A490M when required) complete

with nuts and washer, plain. Hot dip galvanized(A325 only), F1136 ZC grade 3 (A490 only) available upon request (extra).

.8 Anchor Rods: G40.20/G40.21, ASTM A572/A572M, A529/A529M, 50ksi (350/345 MPa) minimum yield, plain (no coating). Hot dip galvanized available upon request (extra).

.2 Secondary Structural:
.1 Purlins, Girts and Framed Openings: minimum 16 gauge (0.060 inch/1.52 mm), Hot Rolled Sheet Steel conforms to G40.21, ASTM A653/A653M, A1011/A1011M, HSLAS Class 1 or 2, or SS, 55 ksi (380 MPa) minimum yield.
.2 Shop Primer Paint: Single Coat Grey Oxide Primer to CISC/CPMA Standard 2-75, 1.5 to 2 mils film thickness. Grey Powder Coat Primer (hybrid), 1.5 mils film thickness. Standard primer not to exceed 90 days exposure to weather.
.3 Bolts: to SAE J429 Grade 8.2.

.3 Bracing Systems:
.1 Purlin/Girt Stabilizers: Minimum 16 gauge (0.060 inch/1.52 mm) see section stabilizers factory cut and pre-packaged shall be provided between purlins/girts to stabilize top and bottom flanges on all roofs with standing seam panels and clips. Number of rows per bay to be determined by design. Hot Rolled Sheet Steel conforms to G40.21 ASTM A653/A653M, A1011/A1011M, HSLAS Class 1 or 2, or SS, 55 ksi (380 MPa) minimum yield. Z275 (G90) pre-galvanized coil.
.2 Flange brace: to G40.21, ASTM A653/A653M, A1011/A1011M, HSLAS Class 1 or 2, or SS, 55ksi (380 MPa) minimum yield, Z275 (G90) pre-galvanized coil.
.3 Rod: to G40.21, ASTM A572/A572M, A529/A529M, 50ksi (350/340 MPa) minimum yield, shop primed with single coat Grey Oxide Primer to CISC/CPMA Standard 2.-75, 1.5 to 2 mils film thickness.
.4 Cable: Galvanized strand to ASTM A475, Grade EHS, 7 wire strand, Class A coating (CSA G12).
.5 Eye bolts: Forged, 1030 carbon steel, hot dip galvanized.

PART 2 - PRODUCTS

2.1
Roof Cladding Systems .1 Sheet Steel: 29 gauge (0.014 inch/0.34 mm) minimum standard factory pre-formed steel aluminum-zinc coated to match existing, pre-finished profile. Include closure, gaskets, caulking, flashing and washered fasteners when specified.

.2 Steel sheet, Aluminum-Zinc Coated: to ASTM A792/A792M structural quality Grade 33 (230 MPa), 37 (255 Mpa), 50 (350 Mpa) or Grade 80 (544 MPa) with AZM165 Galvalume Plus coating, regular spangle surface, passivated for unpainted finish and AZM150 unpassivated for paint finish.

.3 Through Fastened Panel: 28 gauge (0.015 inch/0.38 mm) panel minimum, 1.5 inch (38 mm) deep profile, 36 inch (914 mm) coverage. Major corrugations at 12 inch (305 mm) on centre, shallow corrugations in the panel flat.

.4 Through Fastened Panel: 29 gauge (0.014 inch/0.34 mm) panel minimum, 0625 inch (16 mm) deep profile, 36 inch (914 mm) coverage. Major corrugations at 6 inch (152 mm) on centre, shallow corrugations in the panel flat

.5 Metal building insulation ; mineral fibre insulation

2.2
Roof Stand-Off Systems

.1 Notched Zee: 16 gauge (1.52 mm) minimum, factory notched zee to suit the liner profile. The depth must suit the insulation value required. Hot Rolled Sheet Steel conforms to G40.21, ASTM A1011/A1011M, A653/A653M, HSLAS or SS, Class 1 or 2, 55 ksi (380 MPa) minimum yield, galvanized to G90. Include the required fasteners.

2.3
Wall Cladding Systems
- Exterior

.1 Sheet Steel: factory preformed steel sheet, 29 gauge (0.015 inch/0.34 mm) minimum base metal thickness aluminum-zinc coated pre-finished must match the existing profile. Include closures, gaskets, caulking, flashing and fasteners to effect a weather tight installation.

.2 Steel Sheet, Aluminum-Zinc Coated: must adhere ASTM A792/A792M structural quality Grade 33 (230 MPa), 37 (255 MPa),
50 (350 MPa) or Grade 80 (544 MPa) with AZM165 Galvalume Plus Coating, regular spangle surface, passivated for unpainted finish and AZM150 unpassivated for paint finish.

.3 Steel Sheet, Zinc-Coated or Aluminum-Zinc Coated: must adhere to the ASTM A653M/A653M, structural quality, class 1 or 4, Grade 34 (255 MPa) with ZF75/Z275 for ASTM A653/A653M or with AZM165 Galvalume Plus coating, regular spangle surface, passivated for unpainted finish and AZM150 unpassivated for paint finish.

.4 Paint System: Exterior - Series 20000, interior - washcoat (minimum).

.5 Colour: choose from Manufacturers Standard Series 20000.

.6 Screws: corrosion resistant purpose made, head colour to match cladding.

.7 Concealed fastener Panel: 26 gauge (0.46 mm) panel minimum, 76 mm deep profile, ribbed, 406mm coverage.

2.4
Cladding Systems

.1 Pre-finished System for steel Sheet Exposed to Exterior: Aluminum-zinc coated material with factory applied paint system:
.1 Insulation and Tape: as recommended by manufacturer.
.2 Insulation Adhesive: purpose made for insulation type and steel liner sheet, incombustible after initial set.
.3 Vapor Barrier and Sealing Tape: as recommended by insulation supplier.
.4 Sealant: as recommended by manufacturer.

.2 Fire rated wall system :
.1 As above and in accordance with 1 hour fire rated system to ULC test No. 605.

2.6
Roof Cladding Systems
- Exterior

.1 Sheet Steel: 26 gauge (0.018 inch/1.46 mm) minimum standard factory pre-formed steel sheet aluminum-zinc coated to match existing, pre-finished profile. Include closures, gaskets, caulking, flashing and fasteners to effect weather tight installation.

.2 Steel Sheet, Aluminum-Zinc Coated: to ASTM A792/A792M, structural quality, class 1 or 4. Grade 50 (340 MPa) with AZM165 Galvalume Plus coating, regular spangle surface, passivated for unpainted finish and AZM150 unpassivated for paint finish.

.3 Paint System:
.1 Exterior - Standard 20000 series colours, use a Silicone Modified Polyester paint system.
.2 Interior - washcoat (minimum).

.4 Colour: choose from manufacturers Standard Series 20000.

.5 Screws: corrosion resistant purpose made, head colour to match cladding.

.6 Standing Seam Panel Thermal Clips and Related Panel Fasteners: extra heavy duty, 20 gauge (0.91 mm), corrosion resistant, purpose made clips with movable tabs. Spacing of clips and fasteners to manufacturer's design to suit the loads indicated. Floating clips to allow the roof 89 mm range of thermal movement 44 mm of expansion and 44 mm of contraction.

.7 Thermal Block Spacers: continuous 25 mm thick, extruded polystyrene meeting CAN/CGSB-51.20-M87, Type 4, 210 KPa compressive strength.

2.7
Roof Trim System

.1 Accessories to Roof Cladding: brake or bend to shape, the material and finish to match roof cladding or wall cladding where applicable, comprising cap flashing, drip flashing, coping and closures for corners, soffit and facia.

.2 Ridge Cap: brake or bend to shape, 26 ga (0.46mm) minimum, colour to suit roof cladding or as specified.

.3 Gutters: 26 gauge (0.46 mm) factory brake formed, material and finish to match roof or wall cladding. Include brackets, fasteners, end caps and closures as required.

.4 Downspouts: Available in QC8273 Bone White or QC8229 Dark Brown, 10' lengths.

.5 Downspout Elbows: Available in QC8273 Bone White or QC8229 Dark Brown, 135° only.

2.8
Wall Trim System

.1 Exterior Corners: the material must match the finish and profile of adjacent cladding material, shop cut and brake formed to the correct angle.

.2 Accessories to Exterior Wall Cladding: brake or bend shape, of material and finish to match wall cladding, consisting of cap flashings, drip flashings, corner flashings, header, jamb and sill trims. Closures to be foam (grey only) or metal (colour and material to match wall cladding). All trim Material is to be pre-finished 26 gauge (0.46 mm) minimum.

.3 Foam closures: Cross-linked polyethylene with UV stabilizers. Field applied tape sealant as required.

.4 Downsprouts: 26 gauge (0.46 mm) factory brake formed, material and finish to match wall cladding. 28 gauge (0.38 mm) minimum, roll formed, aluminum alloy #3105-H14 (Dark Brown QC8229, Bone White QC8273).

2.9
Wall Cladding Systems
- Interior Liners

.1 Steel: 29 Gauge (0.014 inch/0.34 mm) minimum standard factory pre-formed steel sheet aluminum-zinc coated to match the existing, pre-finished profile. Include closures, gaskets, caulking, flashing and washered fasteners when specified.

.2 Steel Sheet, Aluminum-Zinc Coated: adhere to ASTM A792/A792M, structural quality Grade 33 (230 MPa), 37 (255 MPa), 50 (350 MPa) or Grade 80 (544 MPa) with AZM165 Galvalume Plus coating, regular spangle surface, passivated for unpainted finish and AZM150 unpassivated for paint finish.

.3 Through Fastened (low profile): 26 gauge (0.46 mm) panel minimum, 307 mm deep profile, 813 mm coverage. Major corrugations at 813 mm on centre, shallow corrugations in panel flat, factory applied side lap sealant. Panel used as wall vapour barrier with notched zee stand-off system.

2.10
Wall Stand -Off Systems

.1 Notched Zee: 16 gauge (1.52 mm) minimum, factory notched zee to suit liner profile. Depth must suit the insulation value required. Hot rolled Sheet Steel conforms to G40.21, ASTM A1011/A1011M, A653/A653M, HSLAS or SS, Class 1 or 2, 55 ksi (380 MPa) minimum yield, galvanized to G60 (minimum). Include required fasteners.

.2 Metal Capped Thermal Block: 18 gauge (1.21 mm) minimum factory applied metal cap to ASTM-A446 grade “A”. galvanized steel ASTM-A 525M Z275. Close-cell polystyrene, compressive strength 30 psi (207kPa). Thermal resistance to ASTM C518-70, RSI 1.74. Include required fasteners.

2.11
Fasteners

.1 Exposed fasteners are to match adjacent panel colours with the exception being galvalume panels which use Bone White fasteners. Exposed fasteners are to be a nylon or painted steel head to resist corrosion. Washered fasteners are to be used on outer roofing, washered fasteners are to be used on outer wall siding. Non-

non-

washered fasteners are to be used on liner cladding unless otherwise.
specified

2.12
Fabrication

.1 Fabricate structural members in accordance with shop drawings and to S16 (CSA). Tolerance not to exceed those specified in CSSBI 30 M.

.2 Provides holes for attachment of other work, as indicated.

2.13
Shop Painting

.1 Clean, prepare surfaces and shop prime structural steel to S16 (CSA) except where members are zinc coated or zinc-aluminum alloy coated or to be encased in concrete.

PART 3 - EXECUTION

3.1
Erection

.1 Perform work in accordance with CSSBI Standard for Steel Building Systems 30 M except where specified otherwise.

.2 Erect structural framing in accordance with erection drawings and to S16 (CSA). Erection tolerances are not to exceed those specified in CSSBI 30 M.

.3 Obtain written permission from manufacturer prior to field cutting or altering of structural members.

.4 Touch up with shop primer bolts, rivets, welds, and burned or scratched surfaces where the exterior exposed is at completion of the erection.

3.2
Wall Cladding

.1 Install wall cladding assemblies ensuring a complete installation.

.2 Secure to structural wall supports.

3.3
Roof Cladding

.1 An Erector must be completely familiar with Steelway's products prior to installation. All related erections drawings, details and manuals must be reviewed prior to commencing work.

.2 Ensure the building is square and plumb before cladding installation. Secure sheets to structural purlins as indicated on ereection

drawings and details. Terminate sheet ends over structural supports.

.3 Secure and continuously seal side and end laps. Apply all caulking and closures as per erection details and Steelway's supplied erection manuals.

.4 Install roof assemblies ensuring a complete and watertight installation.

3.4
Liner Sheets

.1 Install all necessary closures, gaskets, caulking sealants and flashing as recommended by manufacturer.

3.5
Roof Decking

.1 The Erector must ensure they are completely familiar with products prior to installation. All related erection drawings, details and manuals must be reviewed prior to commencing work.

.2 Ensure the building is square and plumb before decking installation.

.3 Secure sheets to structural purlins or OWSJ as indicated on drawings and details. Terminate sheet ends over structural supports.

erection

.4 Secure decking to supports using screws or welds as per the details provided. Clinch side laps as per details provided.

.5 Ensure shoring requirements are followed for the applicable deck profiles, spans and concrete thickness.

END OF SECTION