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Project Manual - Specifications

for

Esprit Place Renovation

3A Beechwood Drive, Parry Sound, ON P2A 1J2

Client:

District of Parry Sound Social Services Administration Board

1 Beechwood Drive

Parry Sound, ON P2A 1J2

Issued for Tender and Permit
Architectural Project No. 2356
March 2024

1 Consultants

.1 The following are the consultants and sub-consultants who have prepared the Contract Documents.

PRIME CONSULTANT / ARCHITECT

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2 Sub-Consultants

STRUCTURAL ENGINEERS

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END OF SECTION

1.1 List of Documents

- .1 The following is a list of all documents issued for Tender, excluding addenda issued during bidding period. The Bidder is responsible for reviewing the documents received and ensuring that all documents are complete.

.2 DRAWINGS:

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Architectural

- A0.0 COVER PAGE
- A0.1 GENERAL NOTES, OBC MATRIX
- A0.2 LEGENDS, FIRE SEPARATION BUILDING SECTION, DOOR AND FRAME ELEVATIONS, FRAME DETAILS
- A1.0 OVERALL SITE PLAN, EXISTING & NEW
- A1.1 DETAILED SITE PLAN - DEMOLITION
- A1.2 DETAILED SITE PLAN - NEW
- A2.0 LOWER LEVEL – DEMOLITION PLAN, FLOOR PLAN
- A2.1 MAIN LEVEL – DEMOLITION PLAN, FLOOR PLAN
- A2.2 UPPER LEVEL – DEMOLITION PLAN, FLOOR PLAN
- A3.1 LOWER LEVEL, MAIN LEVEL - REFLECTED CEILING PLAN
- A3.2 UPPER LEVEL - REFLECTED CEILING PLAN
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- A4.0 BUILDING ELEVATIONS
- A4.1 BUILDING ELEVATIONS
- A5.0 LOWER LEVEL ACCESS DETAILS
- A5.1 RAMP DETAILS
- A5.2 REAR DECK & STAIR DETAILS
- A5.3 TYPICAL STAIR & HANDRAIL DETAILS
- A6.0 INTERIOR ELEVATIONS, KITCHEN / DINING, WASHROOM, LAUNDRY MAIN LEVEL
- A6.1 INTERIOR ELEVATIONS, WASHROOMS, LOWER & UPPER LEVEL
- A6.2 CASEWORK DETAILS

Structural

- S1.1 GENERAL NOTES AND TYPICAL DETAILS
- S2.1 FOUNDATION AND BASEMENT PLAN
- S2.2 FIRST FLOOR FRAMING PLAN
- S2.3 SECOND FLOOR AND LOW ROOF FRAMING PLAN

Plumbing & Mechanical

- M100 MECHANICAL PLUMBING LEGEND, NOTES, SCHEDULE AND SPECS
- M101 MECHANICAL PLUMBING FLOOR PLAN
- M102 MECHANICAL PLUMBING FLOOR PLAN AND DETAILS
- M200 MECHANICAL VENTILATION LEGEND, NOTES AND SCHEDULE

- M201 MECHANICAL VENTILATION FLOOR PLAN AND NOTES
- M202 MECHANICAL VENTILATION FLOOR PLAN, NOTES AND DETAILS

Electrical

- E101 ELECTRICAL SPECIFICATIONS, LEGENDS, RISER DIAGRAM AND SCHEDULES
- E102 ELECTRICAL SITE PLAN
- E201 ELECTRICAL POWER & SYSTEMS BASEMENT FLOOR PLAN
- E202 ELECTRICAL POWER & SYSTEMS FIRST LEVEL FLOOR PLAN
- E203 ELECTRICAL POWER & SYSTEMS UPPER LEVEL FLOOR PLAN
- E301 ELECTRICAL LIGHTING & FIRE ALARM BASEMENT FLOOR PLAN
- E302 ELECTRICAL LIGHTING & FIRE ALARM FIRST LEVEL FLOOR PLAN
- E303 ELECTRICAL LIGHTING & FIRE ALARM UPPER LEVEL FLOOR PLAN

.3 PROJECT MANUAL – SPECIFICATIONS

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See Mechanical & Electrical drawings.

END OF SECTION

1 GENERAL

1.1 Environmental Assessment

- .1 No report is available.

1.2 Designated Substances Survey

- .1 A detailed Designated Substances Survey was prepared by EHS Partnerships Limited. The report dated September 2022 is attached (22 pages).
- .2 Perform Abatement Work to safely remove and abate hazardous materials needed to perform the Scope of Work. No hazardous (designated) materials should remain within the renovated areas unless otherwise noted. Upon completion of abatement, arrange and include testing to confirm and certify that conditions are clear of the hazardous materials.

1.3 Geotechnical Report

- .1 No geotechnical report is available. Upon completion of excavation, the Contractor shall coordinate and arrange a site inspection from the designated geotechnical engineer (as per testing allowance) and the structural engineer for full review. The Contractor shall allow adequate time for review and testing (estimated 5 working days).

1.4 Survey

- .1 A copy of a detailed site plan, with survey information, is included on Drawing A1.1. Site information is taken from previous drawings performed for the Owner, dated circa 2005.

1.5 Limitations of Liability and Reporting

- .1 The Environmental, Designated Substances Survey, Geotechnical Reports and Surveys, by their nature, cannot reveal all conditions that exist or can occur on the site. Should subsurface conditions be found to vary substantially from the report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the contract Price accruing to the Owner.
- .2 The above reports and surveys are provided for information only. The report was commissioned by the Client and not prepared by the Consulting Team. The Consulting Team are not responsible or do not accept any form of liability for information in these documents.

END OF SECTION

1.1 Contract Method

- .1 Single Contract: Construct work under single contract for stipulated price CCDC Document 2, latest edition, with Supplementary General Conditions.

1.2 Division 01 Requirements

- .1 All Sections of Division 01 apply to all sections of Division 02 to Division 16.

1.3 Regulatory Requirements

- .1 Ontario Building Code: Comply with Ontario Building Code 2012 including all amendments. Maintain one copy at the site.
- .2 Construction Safety: Comply with occupational Health and Safety Act and Ontario Fire Code Ontario Regulation 388/97 and amendments.
- .3 Referenced Standards: Comply with specifications standards produced by various organizations, included in the sections. Use latest edition.
- .4 Comply with local bylaws and regulations.

1.4 Examination

- .1 Examine the site of the project. Investigate the complete extent of work which is indicated in the contract documents. No allowance will be made for any error or negligence to fully understand the work and conditions.
- .2 Examine work of other sections before commencing work of any section. Commencement of new work shall imply acceptance of work by other sections upon which the new work depends.
- .3 Verify dimensions of work prepared by other sections before fabrication of new work.

1.5 Project Coordination

- .1 Coordinate progress of the work, progress schedules, submittals, use of site, temporary utilities, construction facilities and controls.
- .2 Provide information required for preparation of coordination drawings. Prepare interference drawings to properly coordinate the work.
- .3 Check and verify all dimensions referring to the work.

1.6 Utilities & Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of work and notify Consultant of findings.
- .2 Where work involves breaking into existing services to remain, protect existing and carry out work at lines approved by owner and with minimum disturbance to user groups and pedestrian/vehicular traffic.
- .3 Where unknown service lines are encountered, immediately advise Consultant and confirm findings in writing.
- .4 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal off lines at cut-off points as directed by Consultant.
- .5 Arrange and pay for any connection charges.
- .6 Record locations of maintained, rerouted and abandoned service lines.

1.7 Air Leakage, Expansion Control and Air/Vapour Barrier

- .1 The General Contractor and all Sub-contractors shall conform to the following requirements to maintain and protect the continuity and integrity of the building air/vapour barrier system.
- .2 Make provisions for expansion, contraction and differential movement between structural frame and wall and roof assemblies.
- .3 Make assembly joints and connections air/vapour tight and provide flexible sealant joints.
- .4 Coordinate installation of all pipes, ducts, conduits and outlets to prevent occurrence of air/vapour leaks in exterior walls. Adequately insulate and provide continuous air/vapour seal at frames and openings at windows, doors, louvres, grilles, ducts, steel members and other openings or projections through walls and roof.
- .5 The vapour barrier is an integral part of the building thermal enclosure and must be maintained intact and continuous on the interior (warm) side of all exterior insulated walls, soffits, overhangs, roofs.
- .6 The vapour barrier membrane is a moisture impermeable sheet and must be maintained in tight physical contact with the interior (warm) side of the insulation and must be sealed air and vapour tight to all designed openings and penetrations and to all other building vapour barrier systems. The vapour barrier is not an air barrier.
- .7 The air barrier is a physically strong and sound barrier designed to resist air movement into or out of a building enclosure and must be able to resist high air pressures without tearing, rupturing or breaking away from its fastening.
- .8 The vapour barrier must be maintained across all expansion and control joints whether indicated and designed or not.
- .9 All Contractors and Sub-contractors and any persons on the site must take all necessary precautions not to puncture, tear, weaken or damage in any way the air/vapour barrier membranes. Any damage shall be sealed to the Architect's approval.
- .10 The vapour barrier membrane must always be protected from the cold in the final building by insulation.

1.8 Materials, Fitments Supplied by Owner

- .1 Include installation of materials, fitments supplied by owner where indicated.
- .2 Provide protected storage on site for materials, fitments and furniture.

1.9 Exterior Wind Load

- .1 Design and install framing, hangers, supports and all accessories required to withstand local wind loads, snow loads and uplifts.

1.10 Concealing Mechanical and Electrical Items

- .1 Drawings are diagrammatic and intended to show general arrangement only.
- .2 Arrange to fully conceal pipes, ducts, conduit components and fitments in finished spaces.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 General Description of the Work
- .2 Work by others
- .3 Timing and sequencing of the Work
- .4 Owner occupancy

1.2 Work Covered by Contract Documents

- .1 Work of this Contract comprises of **various renovations to the interior and exterior of Esprit Place including replacement of flooring, doors, trim and casings, and lighting throughout. The scope of work will also include renovating the existing kitchen, four existing washrooms, exterior ramps, deck replacement, and upgrades to the mechanical and electrical throughout the building.**
- .2 The location of the Work (site) is **3A Beechwood Dr, Parry Sound, ON (P2A 1Z1).**

1.3 Work by Others

- .1 The Owner advises that the following work will be completed under separate contract to the Owner. Work of this Project must include provisions for coordinating additional related work, identified in Contract Documents, for following principal items.
 - .1 Relocation and moving services of furniture and office equipment.
 - .2 Supply and installation of window treatments.
 - .3 Supply and installation of signage and graphics.
 - .4 **Supply of Commercial Dishwasher to Site. Handling and Installation by Contractor.**
- .2 For items furnished by the Owner, the responsibilities of the Contractor and Owner are as follows.
 - .1 Owner Responsibilities:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Arrange and pay for delivery to site in accordance with Progress Schedule.
 - .4 Inspect deliveries jointly with Contractor.
 - .5 Submit claims for transportation damage.
 - .6 Arrange for replacement of damaged, defective or missing items.
 - .7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
 - .2 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule / Quality Control schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of any observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Receive and unload products at site.

- .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
- .5 Handle products at site, including uncrating and storage.
- .6 Protect products from damage, and from exposure to elements.
- .7 Assemble, install, connect, adjust, and finish products.
- .8 Provide installation inspections required by public authorities.
- .9 Repair or replace items damaged by Contractor or Subcontractor on site (under his control).

1.4 Contractor Use of Premises

- .1 Contractor has restricted use of site as strictly defined by extent of contract.
- .2 Preserve safe egress from the building at all times during the execution of the Work and do not impede required exits and access to occupied areas at any time.
- .3 Supply and install temporary signage required to demarcate temporary exit paths to the satisfaction of the Consultant, local building and fire departments.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Assume full responsibility for the protection and safekeeping of products under this Contract.
- .6 The Contractor shall preserve all survey coordinates and demarcations for the property.
- .7 Existing Utilities
 - .1 The Contractor shall take every precaution to prevent or minimize disruption to utilities/services including gas, electrical, communications, water, sanitary and storm services.
 - .2 Accidental disruptions must be attended to immediately. Provisions and procedures for such instances should be put in place in anticipation of them occurring and is especially for the gas, electrical, communication and water services to the building.
 - .3 Planned disruptions shall be coordinated with the Owner, the Municipal authorities, the Consultant and the respective utility service provider. All disruptions will be scheduled to best suit the Owner's operations and may need to be carried out during the evening and weekend hours.
- .8 The Contractor shall maintain safe and continuous flow of traffic for nearby buildings. The Contractor will be responsible to provide and delineate detours for traffic to, from and in the vicinity of the site as required.
- .9 Trucks hauling loose materials from or to the site shall have their loads trimmed and their bodies tight to prevent spillage of loads.
- .10 In the event of the contractor's operation causing delay and inconvenience to the flow of traffic on existing roads, the Consultant may restrict the number of trucks driving into the roads during certain hours. The Contractor will have no claim for additional payment as a result of such restrictions.
- .11 Road Closing
 - .1 No existing Provincial Highway or Municipal streets shall be occupied or closed without permission of the governing authority. The Contractor shall notify the Consultant in writing of proposed road closing at least 96 hours in advance of such action, and shall not detour nor restrict traffic until he has received the governing authority's written approval. All traffic restriction shall comply with Municipal and Ministry of Transportation of Ontario Regulations, whichever govern. All work which restricts or detours traffic shall be carried out systematically and expeditiously so as to minimize the inconvenience to vehicular and pedestrian traffic.
 - .2 Any road closure shall be carried out systematically following the sequence of the underground utility installation and the direction of the Consultant.

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- .3 The Contractor will be responsible for the setting up of and maintenance of signage of all traffic routes for local vehicular and pedestrian traffic within the Contract limits in accordance with the requirements of Section 01501.

1.5 Timing of Work

- .1 Time is of the essence in this contract.
- .2 Start construction immediately following the acceptance of the tender by the Owner.
- .3 **The Contractor agrees to achieve Substantial Performance to achieve occupancy as indicated within the submission.**
- .4 The Contractor may work between the hours of 8am to 5pm on all typical weekdays (Monday to Friday). Extended hours and weekend work may be permitted pending prior approval by the Owner. The Contractor shall coordinate work within adjacent occupied areas with the Owner.
- .5 Perform work continuously toward completion. Periods of inactivity on site will not be permitted without prior consent of the Owner.

1.6 Work Sequence and Phasing

- .1 The existing women's shelter will be vacated for the duration of the project.
- .2 Continuous occupancy is required in the adjoining office facility.
- .3 The sequence of the Work must provide for the uninterrupted safe operation, access and use of all operational facilities, by the Owner, staff and visitors.
- .4 **If any upgrades are required that will require disruption to the Owner's facilities (for example, but not limited to, fire alarms, heating, ventilation and electrical), the Contractor shall perform such Work during off-hours (ie. evenings and weekends) to accommodate typical schedules.**
- .5 Coordinate the sequence of the Work with the Owner's representative to minimize disruption and inconvenience.

1.7 Owner Occupancy

- .1 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.8 Partial Owner Occupancy

- .1 Schedule and substantially complete designated portions of Work for Owner's occupancy prior to Substantial Performance of entire Work.
- .2 Owner will occupy designated areas for purpose of storage of furnishings and equipment, installation of equipment.

1.9 Reference Codes, Standards and Regulations

- .1 Where relevant documents applicable to this work exist, follow these criterion, recommendations, and requirements as minimum standards.
- .2 In event of conflict between Codes, Regulations, or Standards, or where work shown is in conflict with these documents, obtain interpretation before proceeding. Failure to clarify any ambiguity will result in an interpretation requiring application of most demanding requirements.

END OF SECTION

11 GENERAL

1.1 Section Includes

- .1 Cash allowances.
- .2 Contingency allowance.

1.2 References

- .1 CCDC 2, 2020, Stipulated Price Contract.
- .2 Project Supplementary Conditions

1.3 Cash Allowances

- .1 Refer to CCDC 2, GC 4.1.
- .2 Include in Contract Price, cash allowances stated herein.
- .3 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing Work.
- .4 The Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- .5 The Contract Price will be adjusted by written order to provide for an excess or deficit to each cash allowance.
- .6 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in Contract Documents.
- .7 Progress payments on accounts of work authorized under cash allowances shall be included in Consultant's monthly certificate for payment.
- .8 A schedule shall be prepared jointly by Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .9 The overall amount of the cash allowances shall be **\$25,000.00**. This shall include Work specified in respective specification Sections is as follows:
 - .1 Testing, Inspection and Field Engineering.
 - .2 Supply and install electronic door controls, security and camera work. Contractor to coordinate with door supply, electrical and all else.

END OF SECTION

1 General

1.1 Section Includes

- .1 Coordination Work with other contractors under administration of Architect.
- .2 Scheduled progress meetings.

1.2 Related Sections

- .1 Section 01810, Commissioning.
- .2 Section 01770, Closeout Procedures

1.3 Description

- .1 Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities and construction Work, with progress of Work of other contractors, under instructions of Consultant.

1.4 Project Meetings

- .1 Schedule and administer bi-weekly project meetings throughout progress of Work as determined by Consultant.
- .2 The Consultants shall prepare for agenda of all meetings. Agenda to include, but not limited to, the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Consultant and Owner.
- .4 The client will provide physical space for meetings. The Contractor shall provide a table with adequate furnishings for each meeting.
- .5 Preside at meetings.
- .6 The Consultant shall record minutes. Minutes shall include significant proceedings and decisions, with identification of action by parties.
- .7 Reproduce and distribute copies of minutes promptly after each meeting and transmit to meeting participants and affected parties not in attendance.

1.5 Construction Organization and Start up

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

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- .2 Senior representatives of the Owners, Tenants, Engineers, Consultant, Contractor, major Subcontractors, field inspectors and supervisors shall be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
 - .5 Agenda to include following:
 - .1 Appointment of official representative of participants in Work.
 - .2 Schedule of Work, progress scheduling in accordance with Section 01320, Construction Progress Documentation.
 - .3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01330, Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01510, Temporary Utilities.
 - .5 Delivery schedule of specified equipment in accordance with Section 01320, Construction Progress Documentation.
 - .6 Site security in accordance with Section 01520, Construction Facilities.
 - .7 Proposed changes, change orders, procedures, approvals required, mark up percentages permitted, time extensions, overtime, and administrative requirements (GC).
 - .8 Record drawings in accordance with Section 01780, Closeout Submittals.
 - .9 Maintenance in accordance with Section 01780, Closeout Submittals.
 - .10 Take over procedures, acceptance, and warranties in accordance with Section 01770 Closeout Procedures and 01780 Closeout Submittals.
 - .11 Monthly progress claims, administrative procedures, photographs, and holdbacks (GC).
 - .12 Appointment of inspection and testing agencies or firms in accordance with Section 01450 Quality Control.
 - .13 Insurances and transcript of policies (GC).
 - .6 Comply with Consultant's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
 - .7 During construction coordinate use of site and facilities through Consultant's procedures for intra project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
 - .8 Comply with instructions of Consultant for use of temporary utilities and construction facilities.
 - .9 Coordinate field engineering and layout work with Consultant.

1.6 On Site Documents

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Field test reports.
 - .8 Copy of approved Work schedule.
 - .9 Manufacturer's installation and application instructions.
 - .10 Labour conditions and wage schedules.
 - .11 Building Permit

1.7 Construction Progress & Schedules

- .1 Submit preliminary construction progress schedule in accordance with Section 01320, Construction Progress Documents to Consultant. Schedule shall be coordinated with project schedule established by Contract and Consultant.
- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit as directed by Consultant.

1.8 Submittals

- .1 Make submittal to Consultant for review.
- .2 Submit preliminary shop drawings, product data and samples in accordance with Section 01330 for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Consultant.
- .3 Submit requests for payment for review, and for transmittal to Consultant.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Consultant.
- .5 Process substitutions through Consultant.
- .6 Process change orders through Consultant.
- .7 Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

1.9 Coordination Drawings

- .1 Provide information required by Consultant for preparation of coordination drawings.
- .2 Review and approve revised drawings for submittal to Consultant

1.10 Closeout Procedures

- .1 Notify Consultant when Work is considered ready for Substantial Performance.
- .2 Accompany Consultant on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner occupied areas.
- .4 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Schedule, form, content.
- .2 Scheduled revisions.

1.2 Related Sections

- .1 Section 01770 Closeout Procedures.

1.3 Schedules Required

- .1 Submit schedules as follows:
 - .1 Construction Progress Schedule.
 - .2 Submittal Schedule for Shop Drawings and Product Data.
 - .3 Submittal Schedule for Samples.
 - .4 Submittal Schedule for timeliness of Owner furnished Products.
 - .5 Product Delivery Schedule.
 - .6 Cash Allowance Schedule for purchasing Products.
 - .7 Shutdown or closure activity.

1.4 Format

- .1 Prepare schedule in form of a horizontal Gant bar chart.
- .2 Provide a separate bar for each major item of work trade or operation.
- .3 Split horizontally for projected and actual performance.
- .4 Provide horizontal time scale identifying first work day of each week.
- .5 Format for listings: chronological order of start of each item of work.
- .6 Identification of listings: By Systems description.

1.5 Submission

- .1 Submit initial format of schedules within 15 working days after award of Contract.
- .2 Submit schedules in electronic format through email as pdf files.
- .3 Submit 3 hardcopies to be retained by Consultant and Owner.
- .4 Consultant will review schedule and provide comments within 15 days after receipt.
- .5 Resubmit finalized schedule within 7 days after return of review copy.
- .6 Submit revised progress schedule with each application for payment.
- .7 Distribute copies of revised schedule to:
 - .1 Job site office.
 - .2 Subcontractors.
 - .3 Other concerned parties.
- .8 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

1.6 Submittals Schedule

- .1 Include schedule for submitting shop drawings, product data and samples.
- .2 Indicate dates for submitting, review time, re-submission time, last date for meeting fabrication schedule.

END OF SECTION

1 General

1.1 Section Includes

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates and transcripts.

1.2 Related Sections

- .1 Section 01320 - Construction Progress Documentation.
- .2 Section 01450 - Quality Control.
- .3 Section 01820 - Demonstration and Training.
- .4 Section 01780 - Closeout Submittals.
- .5 Section 15075 - Mechanical Identification.

1.3 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, 2008, Stipulated Price Contract.

1.4 Administrative

- .1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups using dimensions of same units as used in documents.
- .4 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .5 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Verify field measurements and affected adjacent Work are coordinated.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .9 Keep one reviewed copy of each submission on site.

1.5 Contract Security.

- .1 Contractor shall acquire at his expense the following bonds:
 - .1 50% Performance Bond
 - .2 50% Labour and Materials Bond
- .2 Submit required Bonds prior to commencing work on site.

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- .3 Bonds shall be issued by a surety company acceptable to the Consultant and kept in force until expiration of the Contract.

1.6 Certificates and Transcripts

- .1 Prior to commencing work on site, and with each application for progress payment submit Clearance Certificate from Workplace Safety & Insurance Board.
- .2 Prior to commencing work on site, in accordance with GC 11.1, submit:
 - .1 Certificate of General Liability Insurance.
 - .2 Certificate of "All Risk" Property and Boiler Insurance.
- .3 Re-submit insurance certificates prior to expiration dates of certificates submitted.

1.7 Contract Cost Breakdown

- .1 Refer to GC 5.2.
- .2 Submit a breakdown of the Contract Price into items related to components of the Work. Items must be small enough to permit analysis of percentage of completion.
- .3 Submit breakdown a minimum of two weeks prior to first application for payment, for approval of the Consultant.
- .4 Include in the breakdown, a line item in the value of **\$5,000** for the submission of administrative documents required under Divisions 00 to 14 (e.g. construction schedule, shop drawing schedule, maintenance manuals, as-built drawings, etc.) by the Contract Documents. This cost is included in the Base Bid and is not a cash allowance.
- .5 Include in the breakdown, a line item in the value of **\$2,500** for the submission of administrative documents required under Divisions 15 and a separate line item in the value of **\$2,500** for the submission of administrative documents required under Divisions 16 (e.g. shop drawing schedule, maintenance manuals, as-built drawings, etc.) by the Contract Documents. This cost is included in the Base Bid and is not a cash allowance.
- .6 Where Phases are involved, the Price Breakdown shall be broken out per phase of construction.

1.8 Building Permit

- .1 Arrange, acquire and pay for all permits and fees required.
- .2 Submit copy of building permit to Consultant, prior to commencing work on Site.
- .3 The Contractor shall submit to the Consultant the original copy of the reviewed Building Permit application contract documents for review within 48 hours of receipt of the Building Permit.

1.9 Shop Drawings and Product Data

- .1 Refer to CCDC 2 GC 3.11.
- .2 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

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- .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.

 - .3 After Consultant's review, distribute copies.
 - .4 Submit 6 prints of shop drawings for each requirement requested in specification Sections and as consultant may reasonably request.
 - .5 Delete information not applicable to project.
 - .6 Supplement standard information to provide details applicable to project.
 - .7 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and re-submission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.10 Samples

- .1 Submit for review samples in triplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Consultant's business address site office.
- .3 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .6 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.11 Mock-ups

- .1 Erect mock-ups in accordance with 01450 - Quality Control.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Tests and mix designs.
- .3 Mock ups.
- .4 Mill tests.
- .5 Equipment and system adjust and balance.

1.2 Related Sections

- .1 Section 01021 Allowances.
- .2 Section 01330 Submittal Procedures.
- .3 Section 01780 Closeout Submittals.

1.3 References

- .1 CCDC 2, Stipulated Price Contract.

1.4 Inspection

- .1 Refer to CCDC 2, GC 2.3.
- .2 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Consultant may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

1.5 Independent Inspection Agencies

- .1 Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work.
- .2 Allocated costs: to Section 01021, Allowances.
- .3 Provide equipment required for executing inspection and testing by appointed agencies.
- .4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Consultant. Pay costs for retesting and re-inspection.

1.6 Access to Work

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

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- .2 Cooperate to provide reasonable facilities for such access.

1.7 Procedures

- .1 Notify appropriate agency and Consultant in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.8 Rejected Work

- .1 Refer to CCDC, GC 2.4.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Consultant.

1.9 Reports

- .1 Submit pdf digital copies of inspection and test reports to Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.10 Tests and Mix Designs

- .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Consultant and may be authorized as recoverable.

1.11 Mock ups

- .1 Prepare mock ups for Work as indicated. Include for Work of all Sections required to provide mock ups.
- .2 Construct in all locations acceptable to Consultant as specified in specific Section.
- .3 Prepare mock ups for Consultant review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.
- .6 Remove mock up at conclusion of Work or when acceptable to Consultant.

1.12 Mill Tests

- .1 Submit mill test certificates as requested required of specification Sections.

1.13 Equipment and Systems

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

END OF SECTION

1 General

1.1 Requirements Included

- .1 Barriers
- .2 Environmental Controls
- .3 Construction Aids
- .4 Use of the work
- .5 Traffic controls
- .6 Utilities
- .7 Protection
- .8 Office and sheds
- .9 Project identification
- .10 Progressive cleaning

1.2 Related Requirements

- .1 Section 01450: Site construction mock-ups.

1.3 Installation/Removal

- .1 Provide construction facilities and temporary controls in order to execute the work expeditiously and as may be required by health and safety legislation.
- .2 Remove from site all such work after use.

1.4 Hoarding

- .1 Provide rigid hoarding, protecting occupants, public and private property from injury or damage. Provide lockable gates within hoarding for access to site by workers and vehicles.
- .2 Erect fencing around perimeter of site to protect the public, workers, public and private property from injury or damage as required.
- .3 Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to building.
- .4 Provide barriers around trees and plants designated to remain. Protect from damage.

1.5 Guard Rails and Barricades

- .1 Provide secure, rigid guard railings and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Provide a protection as required by governing authorities.

1.6 Weather Enclosures

- .1 Provide weathertight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs. Close off floor areas where walls are not finished; seal off other openings; enclose building interior work area for temporary heat.

1.7 Weather Protection of Existing Building

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- .1 Conduct the Work at all times in such a manner as to prevent the ingress of precipitation into the existing building space or existing building elements, and repair promptly any damage which results from any ingress of precipitation in areas adjacent to the Work.
 - .2 Ensure that existing roof drains are functional and not obstructed during the course of the Work and make temporary provision for harmless drainage of water from the roof, should the flow to roof drains be unavoidably obstructed.
 - .3 Protect the existing PVC roofing membrane from damage during the course of the Work, with a complete covering of rigid panels such as plywood, over the roof surface, laid in such a manner as to facilitate movement of workers and materials on the existing roof while preventing damage to the existing membrane.
 - .4 Prior to removal of the existing roofing membrane, cover and seal against water penetration all new vertical elements including but not limited to load-bearing masonry walls, during periods of precipitation and at all times when not required to be uncovered to advance the Work.
 - .5 Ensure that materials installed to protect against water infiltration are installed to withstand the effects of high winds and other foreseeable weather conditions.
 - .6 Monitor weather protection installations periodically, in response to weather conditions, and not less than once per day including during periods of inactivity on site such as weekends and holidays, and repair any damage to weather protection immediately.
 - .7 Provide the Owner with contact names and phone numbers of one person and one alternate person who will, upon notification by a representative of the Owner of the ingress of water into the building, at any time, take immediate and appropriate action to stop any such ingress.

1.8 Dust, Sound and Access Barriers

- .1 Construct rigid temporary barriers complete with sound attenuating batt insulation in stud wall cavity to protect adjacent areas from dust, sound and access between occupied portions of the building and all construction activity, which provide for the security and safety of residents, staff and visitors at all times. Install sealed, lockable doors c/w required hardware as required to keep areas secure and airtight.
- .2 All plenums, attics, HVAC and similar ductwork and openings shall be sealed to prevent dust accumulation and travel into occupied areas.
- .3 In addition to the above, provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, finished areas of work, residents, staff and visitors.
- .4 Maintain and relocate barriers and screens until such work is complete.

1.9 Scaffolding

- .1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs and other such equipment as may be required in a manner which meets the requirements of governing authorities.

1.10 Hoisting

- .1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists and cranes shall be operated by qualified operator.

1.11 Elevators and Lifts

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- .1 Provide protective coverings for finish surfaces of all lifts, cars and entrances, during construction operations.

1.12 Dewatering

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.13 Site Storage/Loading

- .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
- .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.
- .3 A limited portion of the site will be made available for use by the Contractor during each Phase. The Contractor must restrict the storage of materials and equipment to these areas.
- .4 During all phases, deliveries to and waste removal from the building, required for the operation of the facility, must pass through the area designated for Contractor's use during the current Phase. Facilitate safe passage of such vehicles and personnel through the zone of construction activity, and do not unreasonably restrict deliveries or pick-ups.

1.14 Access to Site

- .1 Provide, maintain and repair existing parking lots, roads, sidewalk crossings.
- .2 Provide and maintain temporary ramps and construction runways as may be required for access to the Work, and for use by Owner and public.

1.15 Streets and Traffic Control

- .1 The Contractor shall provide all necessary flagmen, detour signs, warning lights, signs and barricades necessary to notify, direct and protect pedestrian and vehicular traffic en route to and from and within the project limits, and shall conduct his operations to ensure the safety and avoid inconvenience to the travelling public and nearby residents and facility users.
- .2 The Contractor shall maintain access streets to the site clean of dust, mud and debris. The Consultant may request that the Contractor sweep such access streets, if in the opinion of the Consultant the Contractor's operations have created the need. No payment to the Contractor for such demands will be made.

1.16 Construction Parking

- .1 **Parking** will be permitted on site provided it does not disrupt performance of Work or Occupancy.
- .2 Provide and maintain adequate access to project site.
- .3 If authorized to use existing roads for access to project site, make good damage resulting from Contractors' use of roads.

1.17 Sanitary Facilities

- .1 Unless otherwise noted, provide sufficient sanitary facilities for workers in accordance with local health authorities.

- .2 Use of the existing building facilities is permitted within the basement washroom of the facility, pending that the Contractor maintains in clean and working conditions to the approval of the Owner.
- .3 Maintain in clean condition. Repair all damage as needed if caused by Contractor.

1.18 Water Supply

- .1 Water required for construction will be provided at no cost by the Owner from the existing building pending that water not be wasted. The Owner reserves the right to require the Contractor to pay the cost of water if water is found to be wasted.

1.19 Temporary Heating & Ventilation

- .1 Temporary heating for the work area (interior only) will be provided at no cost by the Owner.
- .2 Ventilation maybe limited during construction period, including attendance, maintenance, and fuel, 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.
- .2 Maintain temperatures of minimum 12 degrees C in areas where construction is in progress, unless indicated otherwise in specifications and ensure that the comfort of residents and staff in adjacent occupied spaces is not adversely affected by temperature.
- .3 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .4 Maintain strict supervision of operation of temporary ventilating equipment to to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct fired combustion units to outside.
- .5 On completion of Work for which the permanent heating system is used, replace filters, and turn over equipment in new condition.
- .6 Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is so certified by Consultant.
- .7 Pay costs for maintaining temporary heat, when using permanent heating system.
- .8 The existing or the new permanent heating and ventilating systems of the building or portions thereof, may be used when available and when approved by the Consultant and the Owner. Be responsible for damage to permanent heating system.
- .9 Be responsible for damage to the Work due to failure in providing adequate heat and protection during construction.

1.20 Temporary Power and Light

- .1 Within reason, the Contractor may use the power readily supplied within the area of Work.
- .2 Pay all costs for the installation and distribution of temporary power and lighting.
- .3 Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.
- .4 Interruption of electrical power supply to the building, for purpose of service upgrading and transformer installation must be minimized and under no circumstances may power to the building be interrupted for more than 12 consecutive hours.
- .5 Provide and maintain temporary lighting throughout the project. The level of illumination on all floors and stairs shall not be less than 15 foot candles.

1.21 Temporary Telephone and Communications

- .1 Provide and pay for the temporary communication services for own use and use of Consultant and Owner.
- .2 Provide Site Superintendent with mobile telephone to be carried on his person during normal working hours complete with message recording service.
- .3 Provide one email service, printer, and fax for direct electronic communication to Site.

1.22 Utilities, Fences and Private Property

- .1 The Contractor shall be responsible for the protection of all utilities, fences and private property at the job site during the time of construction.
- .2 Utilities
 - .1 General
 - .1 The Contractor shall pay all costs deemed necessary by the Utility authorities to provide all protective measures within the limits of the Contract. The Contractor shall remain responsible for any unauthorized disruptions of service and any damage to utilities arising out of the Contractor's work, notwithstanding such protection. The Utility authorities will carry out all the work of temporary rearranging and shielding of lines deemed necessary. The cost of all such protective measures, together with the cost of restoring the lines to their original state and location, will be at the expense of the Contractor, and will be billed to the Contractor by the Utility authority.
 - .2 Whenever, in the opinion of the Utility authority, standby crews are necessary during blasting operations, the Contractor shall make the necessary arrangements with the Utility authority and the cost of such crews and equipment shall be billed to the Contractor by the Utility authority. These measures will apply to those utilities located within all blasting areas.
 - .3 The Contractor shall notify in writing the appropriate Utility Companies of construction commencement, with a copy submitted to the Contract Administrator within 3 business days of being granted permission to start work.
 - .4 The Contractor shall notify the appropriate Utility Companies one week in advance of any rock blasting, with a copy submitted to the Contract Administrator within 3 business days.
 - .2 Adjacent Structures and Utilities

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- .1 Perform temporary and permanent support and temporary relocation and replacement of underground or overhead utilities.
 - .2 Permanent relocation of underground or overhead utilities will be carried out by others, if necessitated by coincidence of lines or grades.
 - .3 Existing Drainage and Water Supply
 - .1 Maintain temporary and permanent flow in all sewers, watermains, drains, gutters, ditches, watercourses, house and inlet connections.
 - .2 Maintain the flow in and from the existing utility mains and services by whatever means or material that is necessary until the Consultant permits the use of the constructed main. Include all cost for maintaining flow in the tender prices for sewer and water pipe construction related items.
 - .4 Support of Permanent Underground Utilities
 - .1 Where permanent pipes are uncovered or during the construction of new systems, it is found that the pipes cross each other, the Consultant may direct that concrete be placed to provide support for the pipes. The concrete shall be placed as directed and in locations as determined by the Consultant. The concrete shall be measured in place and payment made in accordance with the allowances of the contract.
 - .2 Where permanent existing services have been uncovered during excavation of trenches for installation of utility mains the Consultant may require a 50 mm x 150 mm creosote wood plank be placed under each pipe on a thoroughly compacted bed throughout the entire width of excavation so that this pipe is fully supported by the timber. Sand cushion material shall be surrounding each pipe and be of no less than 150 mm thickness from the outside diameter of the pipe, hand compacted and backfilled as directed by the Contract Administrator. Wooden planks to be provided by the Town.
 - .3 Place concrete in accordance with the direction of the Consultant. Supply and place concrete in accordance with OPSS 904.
 - .5 Support of Gas Pipelines
 - .1 General
 - .1 This following applies to all excavations of gas company underground plant.
 - .2 Gas pipelines shall be supported at all times to prevent damage to the pipeline from deflection due to its own weight plus any other load that may be imposed on it.
 - .2 Temporary Support
 - .1 A suitable method of supporting gas pipelines shall be used when an excavation will result in unsupported pipe spans exceeding the maximum spans permitted by the gas company. Provide suitable, temporary support acceptable to the gas company.
 - .2 Temporary support shall remain in place until permanent support is provided and shall be inspected at least every three weeks by personnel from the gas company.
 - .3 Permanent Support
 - .1 Permanent support of a gas pipeline shall be provided by either a properly compacted backfill method or a structural method. A properly compacted backfill method is preferred.
 - .2 Where proper support cannot be provided with backfill material, permanent structural supports shall be installed. The appropriate gas authority shall provide some typical designs. Where these designs are not suitable, the Engineer shall be consulted for a custom design.
 - .6 Protection and Locations
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- .1 Prior to commencing any excavation work, notify applicable utility authorities, establish location and state of use of buried services. Clearly mark such locations to prevent disturbances during work.
 - .2 Maintain and protect from damage, water, sewer, gas electric or other utilities encountered.
 - .3 Obtain direction of Owner of utility and Consultant before moving or otherwise disturbing utility.
 - .4 Utilities that require permanent relocation will be the responsibility of the utility company concerned at no expense to the Contractor. Cooperate with the utility companies who shall have free access to their plant at all times.
 - .5 Where existing pipes, ducts, or other underground services intersect the pipe trench, support the pipe trench to the approval of the Consultant and the utility company.
 - .6 Where existing overhead poles are adjacent to the excavation, temporarily support them to the approval of the Consultant and the utility company concerned.
 - .7 Notify Fire Department of any planned or accidental interruption of water supply to hydrants.
 - .8 The position of all pole lines, conduits, watermains, sewers and other underground and overground utilities and structures is not necessarily shown on the contract drawings, and, where shown, the accuracy of the position of such utilities and structures is not guaranteed and the Owner disclaims, on behalf of himself and those responsible for such drawings, all liability with respect to same. Before starting work, the Contractor shall inform himself of the exact locations of such utilities and structures, and shall be liable for damages to them as a result of any act or omission, whether or not the result of negligence, by those for whom he is responsible. The Contractor waives any claim and releases the Owner and the agents of the Owner from all liability for damages suffered as a result of such contract drawings. Size, depth and location of existing utilities as shown is for guidance only; completeness and accuracy of information is not guaranteed.
 - .9 Protect existing buildings, trees and other plants, lawns, fencing, service poles, wires or paving located within right of way or adjoining properties from damage while work is in progress and repair damage resulting from work.
 - .10 Where excavation necessitates root or branch cutting, do so only under direct control of the Consultant.
 - .11 Whenever shoring, sheeting, timbering and bracing of excavations is required, engage services of a Professional Engineer to design and assume the responsibility for adequacy of shoring and bracing. Professional Engineer to be registered in province of territory in which work is to be carried out.
 - .12 When requested, submit for review, drawings and calculations signed and stamped by Professional Engineer responsible for their preparation. Close sheeting, when required, to be designated and constructed to prevent adjacent soil or water from entering excavation.
 - .13 Maintain unobstructed access to fire and police appurtenances, telephone, electric, water, sewer, gas, or other public utilities and private properties.
 - .14 Immediately take all necessary action for the repair of damaged utilities and pay all cost for the repair work.
 - .15 Refer to existing utility information that may be contained in this Contract.
- .7 Private Lands
- .1 The Contractor shall not enter upon or occupy with men, equipment or materials of any nature or store any materials on any private property unless he has obtained a consent from the property owner and a copy of such consent has been furnished to the Consultant.
 - .2 Any resulting costs for occupying private lands shall be at the Contractor's expense.

1.23 Fire Protection

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Open fires and burning of rubbish are not permitted on the site.
- .3 Fire Routes: Maintain access to property including overhead clearances for use by emergency response vehicles.

1.24 First Aid

- .1 The Contractor shall provide and maintain on the site where construction is being carried out, completely equipped first aid facilities in a clean orderly condition, which shall be readily accessible at all times to all his employees and the Consultant and his staff.
- .2 The Contractor shall designate certain employees who are properly instructed to be in charge of first aid. At least one such employee shall always be available on the site while work is being carried on.
- .3 A telephone call list for summoning aid such as doctors, ambulances, and rescue squads from outside sources shall be conspicuously posted.

1.25 Protection of Building Finishes & Equipment

- .1 Provide protection for the existing facility and for new finished and partially finished building components and equipment during performance of Work.
- .2 Provide necessary screens, covers, hoardings as required.
- .3 Be responsible for damage incurred due to lack of or improper protection.

1.26 Security

- .1 Provide and pay for responsible security personnel to guard the site and contents of the site after working hours and during holidays as required. Decision to provide security personnel resides solely with the Contractor.

1.27 Spills Reporting

- .1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Engineer. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1980.
- .2 All spills or discharge of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.
- .3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

1.28 Protection of Water Quality

- .1 At all times, the Contractor shall maintain existing stream flows and shall control all construction work so as not to allow sediment or other deleterious materials to enter streams.

- .2 No waste or surplus organic material including topsoil is to be stored or disposed of within 30 metres of any watercourses. Run-off from excavation piles will not be permitted to drain directly into watercourses but shall be diffused onto vegetative areas a minimum of 30 metres from the watercourse. Where this measure is not sufficient or feasible to control sediment entering the watercourses, sedimentation traps or geotextile coverage will be required.
- .3 If dewatering is required, the water shall be pumped into a sedimentation pond or diffused onto vegetated areas a minimum of 30 metres from the watercourses and not pumped directly into the watercourses.
- .4 No machinery shall enter the creek bed of any watercourse. Movement of construction equipment in the vicinity of any creek shall be limited to the minimum required for construction.
- .5 The Contractor shall not carry out equipment maintenance or refueling or store fuel containers within 100 metres of any watercourse. The Contractor shall not stockpile construction debris or empty fuel/pesticide containers within the Contract limits.

1.29 Offices

- .1 Provide and maintain in clean condition during progress of Work, adequately lighted, heated and ventilated Contractor's office with space for filing and layout of Contract Documents and contractors normal site office staff, and site meetings.
- .2 Provide adequate required first aid facilities.
- .3 Subcontractors may provide their own offices upon approval from Owner.
- .4 The Owner shall review and govern locations of all offices. If relocation is required by the sole discretion of the Owner, the Contractor shall relocate as required.

1.30 Equipment/Tool/Materials Storage

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause the least interference with work activities.

1.31 Construction Signs

- .1 Erect Owner and Consultant project signs, in location(s) as designated by the Consultant.
- .2 Provide lumber framing as required to provide secure, wind resistant installation. Brace as required.
- .3 Maintain sign in good condition for the duration of Work. Clean periodically.

1.32 Project Cleanliness

- .1 Maintain the Work in tidy condition, free from the accumulation of waste products and debris.
- .2 Remove waste material and debris from the site and deposit in waste container at the end of each working day.
- .3 Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.33 Workplace Hazardous Material Information System (WHMIS)

- .1 Prior to the commencement of work, the Contractor shall provide, to the Consultant, a list of those products controlled under the WHMIS, which he expects to use on the contract. Related Material

Safety Data Sheets shall accompany the submission. All containers used in the application of products controlled under WHMIS shall be labelled.

- .2 The Contractor shall notify the Consultant of changes to the list in writing and provide relevant material Safety Data Sheets.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.

1.2 Related Sections

- .1 Section 01450, Quality Control.
- .2 Section 01730, Execution.

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 2008, Stipulated Price Contract.
- .2 Within the text of the specifications, reference may be made to the following standards:

| | |
|-------|--|
| ACI | American Concrete Institute |
| AISC | American Institute of Steel Construction |
| ANSI | American National Standards Institute |
| ASTM | American Society of Testing and Materials |
| AWMAC | Architectural Woodwork Manufacturers Association of Canada |
| CEC | Canadian Electrical Code including Ontario Supplement (published by CSA) |
| EEMAC | Electrical and Electronic Manufacturers Association of Canada |
| CGSB | Canadian General Standards Board |
| CISC | Canadian Institute of Steel Construction |
| CLA | Canadian Lumberman's Association |
| CPCA | Canadian Painting Contractors' Association |
| CPCI | Canadian Prestressed Concrete Institute |
| CRCA | Canadian Roofing Construction Association |
| CSA | Canadian Standards Association |
| FM | Factory Mutual Engineering Corporation |
| IEEE | Institute of Electrical and Electronic Engineers |
| IPCEA | Insulated Power Cable Engineers Association |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NBC | National Building Code |
| NEMA | National Electrical Manufacturers Association |
| OPSD | Ontario Provincial Standards for Roads & Municipal Services |
| TTMAC | Terrazzo, Tile and Marble Association of Canada |
| ULC | Underwriters' Laboratories of Canada |

- .3 Conform to these standards, in whole or in part as specifically requested in specifications.
- .4 If there is question as to whether any product or system is in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
- .5 The cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

-
- .6 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.4 Quality

- .1 Refer to CCDC 2, GC 3.9.
- .2 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4 Should any dispute arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 Availability

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 Storage, Handling and Protection

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Consultant.
- .9 Touch up damaged factory finished surfaces to Consultant's satisfaction. Use touch up materials to match original. Do not paint over name plates.

1.7 Transportation

- .1 Pay costs of transportation of products required in performance of Work.

1.8 Manufacturer's Instructions

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re installation at no increase in Contract Price or Contract Time.

1.9 Quality of Work

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.10 Coordination

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 Concealment

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.12 Remedial Work

- .1 Refer to CCDC 2, GC 3.13 and Section 01730 Execution.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 Location of Fixtures

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Consultant of conflicting installation. Install as directed.

1.14 Fastenings

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.15 Fastenings and Equipment

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.16 Protection of Work in Progress

- .1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Consultant.

1.17 Existing Utilities

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

1 GENERAL

1.1 References

- .1 Canada Labour Code, Canada Occupational Safety and Health Regulations.
- .2 Canadian Standards Association (CSA)
 - .1 CSA S350-M1980, Code of Practice for Safety in Demolition of Structures.
- .3 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990.

1.2 Construction Safety Measures

- .1 Comply with:
 - .1 National Building Code, Part 8, Safety Measures at Construction and Demolition Sites.
 - .2 Workers Safety and Insurance Board.
 - .3 Municipal Authorities

1.3 Filing of Notice

- .1 File Notice with Provincial authorities prior to commencement of Work.

1.4 Work Permit

- .1 Obtain Ministry of Labour Notification of Project Permit prior to commencement of work.

1.5 Safety Assessment

- .1 Perform site specific safety hazard assessment related to project.

1.6 Meetings

- .1 Pre-construction meetings: attend health and safety pre-construction meeting.

1.7 Regulatory Requirements

- .1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

1.8 WHMIS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, labelling and disposal of hazardous materials. Provide Material Safety Data Sheets.
- .2 Maintain copies of WHMIS data sheets on file at site, turn over to Owner on completion of project, under Section 01780.

1.9 Fire Safety Requirements

- .1 Comply with requirements of Fire Commission of Canada, Labour Canada.
- .2 Inform Municipal Fire Department of progress of work. Advise representatives of any potential hazardous operations or shut down of safety systems or devices.
- .3 Provide any details required by Fire Department.

1.10 Overloading

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

1.11 Falsework

- .1 Design and construct falsework to CSA S269.1.

1.12 Scaffolding

- .1 Design and construct scaffolding to CSA S269.2.

1.13 Responsibility

- .1 Be responsible for safety of persons and property on site and for protection of persons off site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Comply with Ontario Health and Safety Act.

1.14 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Consultant verbally and in writing.

1.15 Correction of Non-Compliance

- .1 Immediately address health and safety non-compliance issues identified by Consultant.
- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.16 Powder Actuated Devices

- 1. Use powder actuated devices only after receipt written permission from Consultant.

1.17 Work Stoppage

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Health and Safety Officer to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Consultant may also stop Work for health and safety considerations.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Requirements and limitations for cutting and patching the Work.

1.2 Related Sections

- .1 Section 01110 Summary of Work.
- .2 Section 01330 Submittal Procedures.
- .3 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

1.3 Submittals

- .1 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather exposed or moisture resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight exposed elements.
 - .5 Work of Owner or separate contractor.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.4 General

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete the Work.
- .2 Fit the several parts together, to integrate with other work.
- .3 Uncover work to install ill-timed work.
- .4 Remove and replace defective and non-conforming work.
- .5 Remove samples of installed work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical work.

1.5 Preparation

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

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- .5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.6 Execution

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather exposed and moisture resistant elements, and sight exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated walls, ceilings, or floor constructions, completely seal voids with firestopping material, full thickness of the construction element.
- .13 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.7 Materials

- .1 Required for original installation.
- .2 Change in Materials: Submit request for substitution in accordance with Section 01330, Submittal Procedures.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Progressive cleaning.
- .2 Final cleaning.

1.2 Related Section

- .1 Section 01770 Closeout Procedures.

1.3 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.

1.4 Project Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use clearly marked separate bins for recycling.
- .7 Remove waste material and debris from site at end of each working day.
- .8 Dispose of waste materials and debris off site.
- .9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .12 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.5 Final Cleaning

- .1 Refer to CCDC 2, GC 3.14.
- .2 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris.
- .6 Remove waste materials from site at regularly scheduled times. Do not burn waste materials on site.

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- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
 - .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and ceilings.
 - .10 Clean lighting reflectors, lenses, and other lighting surfaces.
 - .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
 - .13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .14 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .15 Remove dirt and other disfiguration from exterior surfaces.
 - .16 Clean and sweep roofs, gutters, areaways, and sunken wells.
 - .17 Sweep and wash clean paved areas.
 - .18 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
 - .19 Clean roofs, downspouts, and drainage systems.
 - .20 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
 - .21 Remove snow and ice from access to building.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Administrative procedures preceding preliminary and final inspections of Work.

1.2 Related Sections

- .1 Section 01320 Construction Progress Submittals.
- .2 Section 01810 Commissioning.

1.3 References

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2, Stipulated Price Contract.
- .2 OAA/OGCA Take-Over Procedures, Document 100

1.4 Substantial Performance Procedures

- .1 Project takeover procedures will generally follow the "OAA/OGCA Take-Over Procedures", Document 100, except as augmented herein.
- .2 Refer to General Conditions Article GC5.4 to 5.9.
- .3 Prior to making application for certification of Substantial Performance, the Contractor shall undertake a formal inspection of the Work. Following this inspection, the Contractor shall produce a complete list of all uncompleted or unsatisfactory work. This list shall identify uncompleted or unsatisfactory work by room number for all interior spaces and by exterior location. This list shall be distributed to the appropriate sub-contractors for immediate action. This list will also be submitted to the Consultant on paper, and in digital format using Microsoft Word software.
- .4 Make written application to the Consultant for Substantial Performance at least 3 weeks prior to the anticipated date of Certification of Substantial Performance. Such application shall include:
 - .1 A statement that the Contract is substantially performed.
 - .2 A statement that the balance of the work is in progress and the date upon which completion is scheduled. Where the balance of the Work, or a portion thereof, cannot be performed forthwith, and the Contractor wishes to propose a deferral of some component of the Work, the application must include an explanation of the proposed deferral and completion dates for all components to be deferred.
 - .3 An itemized invoice for payment which substantiates the application for Substantial Performance.
 - .4 A statement of the cost value of
 - .1 Work yet to be completed including unsatisfactory work
 - .2 Work which, if agreed by the Owner, will not be completed expeditiously.
- .5 The application for Substantial Performance will not be considered or acted upon by the Consultant until such time as the Consultant has been provided with the following:
 - .1 A complete deficiency list prepared by the General Contractor and circulated for action to sub-contractors as specified above.
 - .2 Project Documentation to be provided at Substantial Performance shall include:
 - .1 Letter requesting a review for Substantial Performance
 - .2 Application for Payment that reflects the completion of Contract Value required for Substantial Performance. Submit as per Section 01330, Submittals Procedures.

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- .3 All safety certificates, air balancing reports, manuals and binders required for occupancy.
 - .6 An Inspection for Substantial Performance will be conducted within 10 days of Application for Substantial Performance and satisfaction of the requirements of .5 above.
 - .7 The Inspection for Substantial Performance must include representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
 - .8 At the Inspection for Substantial Performance, the Consultant will compile a list of deficiencies and defects. The Consultant reserves the right to refuse to complete an Inspection for Substantial Performance and a deficiency list, if in the Consultant's opinion the incomplete or unsatisfactory work far exceeds that required to achieve Substantial Performance.
 - .9 If, in the judgement of the Consultant, the requirements of the Construction Act for Substantial Performance have been achieved, the Consultant will issue a Certificate of Substantial Performance within 7 days of the inspection.
 - .10 If, in the judgement of the Consultant, the requirements of the Construction Act for Substantial Performance have not been achieved, the Consultant shall notify the Contractor and the Contractor shall expedite the correction of incomplete or unsatisfactory work required to achieve Substantial Performance, and, within two weeks of initial inspection, make written application for re-inspection for Substantial Performance.
 - .11 The Consultant, shall provide only one re-inspection for Substantial Performance within his fee for Basic Services. Inspections beyond this, required to achieve Substantial Performance, will be charged to the Owner as Additional Services as per the terms of the Client Architect Agreement. The Owner shall be entitled to deduct from any money owing to the Contractor the cost of such additional inspections.
 - .12 Upon issuance of the Certificate of Substantial Performance, the Contractor will, in accordance with the Construction Act, promptly publish the Certificate of Substantial Performance and provide the Consultant with proof of its publication.
 - .13 Upon publication of the Certificate of Substantial Performance, the Contractor shall submit to the Consultant an invoice for the value of holdback monies to be released at the expiration of the lien period. This submission must include a Statutory Declaration and a Clearance Certificate issued by the Workplace Safety & Insurance Board.
 - .14 The Consultant shall immediately issue a Certificate for the release of holdback dated one day following the expiration of the lien period. The Consultant will present this to the Owner with instructions to satisfy himself that no liens are registered and no notice of Lien filed against the title of the property, and only if such is the case, to pay holdback monies identified as due by the Certificate.
 - .15 The Contractor and sub-contractors shall continue to work to complete all work and repair all deficiencies and defects promptly.

1.5 Final Inspection Procedures

- .1 Project takeover procedures will generally follow the "OAA/OGCA Take-Over Procedures", Document 100, except as augmented herein.
- .2 Upon completion of the Work and deficiencies and defects such that value of outstanding work does not exceed \$1,000, verified by the Contractor's own inspection, the Contractor shall make written application to the Consultant for Final Inspection. Such application shall include:
 - .1 A statement that the Contract is totally performed.
 - .2 An itemized invoice for payment which substantiates the application for Total Performance, including a statement of the holdback monies for finishing work.

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- .3 The application for Final Inspection will not be considered or acted upon by the Consultant until such time as the Consultant has been provided all Project Documentation to be provided before issuance of Final Payment Certificate - see Specification Section 01320.
 - .4 The Final Inspection must include representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
 - .5 At the Final Inspection, the Consultant will review the work indicated by the list of deficiencies and defects.
 - .6 If, in the judgement of the Consultant, the Work is satisfactorily completed, the Consultant will issue a Certificate for Payment for the value of the work, less 10% holdback. The date of this certificate shall be deemed the date of completion and the commencement of the lien period for finishing holdback.
 - .7 If, in the judgement of the Consultant, the Work is not satisfactorily completed, the Consultant shall notify the Contractor of outstanding deficiencies and the Contractor shall expedite the correction of incomplete or unsatisfactory work as soon as possible and make written application for re-inspection. No certificate of payment will be issued until Total Performance has been achieved.
 - .8 The Consultant, shall provide only one Final Inspection following Substantial Performance within his fee for Basic Services. Inspections beyond this, required to achieve a Final Payment Certificate, will be charged to the Owner as Additional Services as per the terms of the Client Architect Agreement. The Owner shall be entitled to deduct from any money owing to the Contractor the cost of such additional inspections.
 - .9 Upon issuance of this payment certificate, the Contractor shall submit to the Consultant an invoice for the value of finishing holdback monies to be released at the expiration of the lien period. This submission must include a Statutory Declaration and a Workers Compensation Board Certificate of Good Standing.
 - .10 The Consultant shall prepare a Certificate for the release of holdback dated one day following the expiration of the lien period. The Consultant will present this to the Owner with instructions to satisfy himself that no liens are registered and no notice of Lien filed against the title of the property, and only if such is the case, to pay holdback monies identified as due by the Certificate.

1.6 Warranty Inspection Procedures

- .1 Refer to requirements of GC 12.3.
- .2 Near the end of the warranty period, an inspection meeting will be convened to be attended by representatives of:
 - .1 The Consultant
 - .2 The Sub-Consultants as deemed necessary by Consultant
 - .3 The Owner
- .3 The Consultant will prepare and issue to the Contractor a list of observed defects required to be corrected.
- .4 The Contractor shall promptly correct all observed defects.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 As built, samples, and specifications.
- .2 Equipment and systems.
- .3 Product data, materials and finishes, and related information.
- .4 Operation and maintenance data.
- .5 Spare parts, special tools and maintenance materials.
- .6 Warranties and bonds.
- .7 Final site survey.

1.2 Related Sections

- .1 Section 01320, Construction Progress Documentation
- .2 Section 01330, Submittal Procedures.
- .3 Section 01450, Quality Control.
- .4 Section 01770, Closeout Procedures.

1.3 Submission

- .1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned, with Consultant comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, (3) final copies of operating and maintenance manuals in English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.
- .9 **Refer to Section 01330 for Values associated with accepted Close-Out Documentation.**

1.4 Format

- .1 Organize data in the form of an instructional manual. Also provide digital copy of all material within a single, labeled and organized file.
- .2 Binders: vinyl, hard covered, 3 D-ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: Identify each binder with type or printed title "Project Record Documents"; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.

- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on compact disc.

1.5 Contents, Each Volume

- .1 Table of Contents: provide title of project;
 - .1 date of submission; names,
 - .2 addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;
 - .3 schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01450 Quality Control.
- .6 Training: Refer to Section 01820 Demonstration and Training.

1.6 As-builts and Samples

- .1 In addition to requirements in General Conditions, maintain at the site for Consultant and Owner, one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Consultant.

1.7 Recording Actual Site Conditions

- .1 Record information on set of opaque drawings, provided by Consultant.

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- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
 - .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
 - .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
 - .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
 - .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.8 Final Survey

- .1 No final survey is required under the Base Bid.

1.9 Equipment and Systems

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with ing data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start up, break in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

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- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 - .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - .14 Include test and balancing reports as specified in Sections 01450, Quality Control and 01810, Commissioning.
 - .15 Additional requirements: As specified in individual specification sections.

1.10 Materials and Finishes

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture protection and Weather exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional Requirements: as specified in individual specifications sections.

1.11 Spare Parts

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.12 Maintenance Materials

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site location as directed; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.13 Special Tools

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.14 Storage, Handling and Protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

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- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
 - .3 Store components subject to damage from weather in weatherproof enclosures.
 - .4 Store paints and freezable materials in a heated and ventilated room.
 - .5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.15 Warranties and Bonds

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principals.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittal.

END OF SECTION

1 GENERAL

1.1 Section Includes

- .1 Procedures for demonstration and instruction of equipment and systems to Owner's personnel.

1.2 Related Sections

- .1 Section 01780 Closeout Submittals.
- .2 Section 01810 Commissioning.

1.3 Description

- .1 Demonstrate operation and maintenance of equipment and systems to Owner's personnel two weeks prior to date of substantial performance.
- .2 Owner will provide list of personnel to receive instructions and will coordinate their attendance at agreed upon times.

1.4 Quality Control

- .1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.

1.5 Submittals

- .1 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Consultant's approval.
- .2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

1.6 Conditions for Demonstrations

- .1 Equipment has been inspected and put into operation in accordance with Section.
- .2 Testing, adjusting, and balancing has been performed in accordance with Section 01810 Commissioning and equipment and systems are fully operational.
- .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.7 Preparation

- .1 Verify that conditions for demonstration and instructions comply with requirements.
- .2 Verify that designated personnel are present.

1.8 Demonstration and Instructions

- .1 Demonstrate start up, operation, control, adjustment, trouble shooting, servicing, and maintenance of each item of equipment at scheduled agreed upon times, at the equipment, designated location.

- .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .3 Review contents of manual in detail to explain all aspects of operation and maintenance.
- .4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

1.9 Time Allocated for Instructions, Video

- .1 Ensure amount of time required for instruction of each item of equipment or system is adequate for owner's understanding.
- .2 The Contractor shall allow the Owner to record all demonstrations by video for records and maintenance purposes.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Requirements for selective demolition of portion, or portions, of existing buildings in preparation for renovation or re-modeling. Demolition work shall include the draining and capping and/or re-routing of existing building services, protection of remaining structure and other building elements, and removal of debris.

1.3 RELATED SECTIONS

- .1 Temporary Barriers and Enclosures, Section 01560
- .2 Environmental Protection, Section 01561

1.4 REFERENCES

- .1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures. .2 Occupation Health and Safety Act and Regulations for Construction Projects; Ontario Reg.213/91, as amended by Reg. 145/00.

1.5 SUBMITTALS

- .1 Demolition Drawings
 - .1 Where required by authorities having jurisdiction, submit drawings, diagrams, and/or details for approval, clearly indicating sequence of demolition work, support of existing structures, shoring, and underpinning.
 - .2 Where required by authorities having jurisdiction, such drawings to bear stamp of qualified professional engineer registered or licensed in the Province of Ontario.

1.6 EXISTING CONDITIONS

- .1 Structures to be partially demolished shall be based on their condition at time of examination during the Bid Period.

2 PRODUCTS

NOT APPLICABLE.

3 EXECUTION

3.1 PROTECTION

- .1 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades, and other parts of existing building to remain. Provide all bracing, shoring, and/or underpinning required. Make good damage caused by demolition.
- .2 Take precautions to support affected structures and if safety of building being demolished, or adjacent structures or services appears to be endangered, cease operations and notify Consultant.
- .3 Prevent dust and debris from blocking surface drainage systems, or affecting elevators, mechanical, and/or electrical systems which must remain in operation.
- .4 Adhere strictly to requirements of Sections 01560 and 01561 during demolition and removal process. Provide all temporary safety controls, as required by The Occupational Health & Safety Act, and Section 01500.
- .5 Ensure that secure site hoarding and/or fencing is in place and complete, prior to commencement of demolition operations. Maintain hoarding during demolition operations. Replace or repair sections of hoarding damaged or removed, as a result of demolition operations.

3.2 PREPARATION

- .1 Locate and mark all enclosed or hidden services within the structure, and on the site.
- .2 Disconnect and re-route electrical and telephone service lines entering areas to be demolished, in accordance with authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized during period of demolition.
- .3 Disconnect and cap, designated mechanical services in accordance with authorities having jurisdiction;
 - .1 Natural gas supply lines to be removed by local gas authority where required, or by qualified tradesman in accordance with gas authority instructions.
 - .2 Disconnect, and cap remove sewer and water lines to point indicated on drawings.
 - .3 Remove and dispose of other underground services as indicated on drawings, and as directed by Consultant.
- .4 Do not disrupt active or energized utilities traversing premises, designated to remain undisturbed.

3.3 SAFETY CODE

- .1 Unless otherwise specified, carry out demolition work in accordance with CSA S350.

3.4 DEMOLITION

- .1 Demolish parts of building to permit construction of addition and/or remedial work as indicated.
- .2 All concrete and masonry broken from demolition work to be removed from open basements or excavations.
- .3 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace same as work progresses.

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- .4 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times.
 - .5 Demolish to minimize dusting. Keep dusty materials wetted as directed by Consultant.
 - .6 Demolish masonry and concrete walls in small sections to prevent damage to existing structure or surfaces to remain.
 - .7 Remove contaminated or dangerous materials, as defined by authorities having jurisdiction, from site, and dispose of in strict accordance with by-laws, regulations and/or guidelines applicable to such material.

3.5 SITE CLEANING

- .1 Promptly remove and dispose of demolished materials except where noted otherwise, in accordance with authorities having jurisdiction.
- .2 Do not sell, bury or burn materials on site.
- .3 Leave interior areas in a "swept clean" condition after demolition in preparation for remedial work.
- .4 If affected by demolition, leave exterior soft areas in a "raked clean" condition, and clear of all debris. Leave paved areas in a "swept clean" condition, and clear of all dirt, debris, and other contamination.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01021, Allowances
- .2 Section 01330, Submittal Procedures
- .3 Section 01560, Temporary Barriers and Enclosures
- .4 Section 01561, Environmental Protection
- .5 Section 01610, Basic Product Requirements
- .6 Section 02231, Earthwork & Related Work

1.2 REFERENCES

- 1. Ontario Provincial Specifications (OPSS) 1010 Material Specification for Aggregates
- 2. ASTM C 136 95a, Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- 3. ASTM D 698 91, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort 600 kN m/m³.
- 4. CAN/CGSB 8.2 M88, Sieves, Testing, Woven Wire, Metric.
- 5. CAN/CSA A23.1 94, Concrete Materials and Methods of Concrete Construction

1.3 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock: any solid material in excess of 1m³ and which cannot be removed by means of duty mechanical excavating equipment having a 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: excavation of material of whatever nature, which is not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in work.
- .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .4 Waste material: excavated material unsuitable for use in work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work.
- .6 Unsuitable materials:
 - .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB 8.1.

.2 Table

| Sieve Designation | % Passing |
|-------------------|-----------|
| 2.00 mm | 100 |
| 0.10 mm | 45 - 100 |
| 0.02 mm | 10 - 80 |
| 0.005 mm | 0 - 45 |

.3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.7 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 ROCK EXCAVATION

.1 Rock is defined as any solid material in excess of 0.4m³ which cannot be removed by means of heavy duty power shovel, except after drilling and blasting.

.2 Execute all blasting operations in accordance to requirements of the Occupational Health and Safety Act and Regulations for construction projects.

.3 Retain licensed explosive expert to supervise and program blasting work.

.4 **Rock Excavation is not anticipated for this project.**

1.5 SAMPLES

.1 Submit samples in accordance with Section 01330, Submittal Procedures.

.2 Inform Consultant at least 4 weeks prior to commencing work, of proposed source of fill unshrinkable fill materials and provide access for sampling.

.3 Submit 70 kg samples of type of fill and unshrinkable fill specified including representative samples of excavated material.

.4 Deliver samples prepaid to testing laboratory, in tightly closed containers to prevent contamination.

1.6 PROTECTION OF EXISTING FEATURES

.1 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to commencing excavation work, notify applicable owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, gas, electric, and structures encountered as indicated, as well as all others located by applicable Owner or Authorities.

- .2 Existing buildings and surface features:
 - .1 Conduct, with Consultant, condition survey of existing buildings, trees and other plants, service poles, wires, pavement, survey benchmarks and monuments which may be affected by work.
 - .2 Protect surface features from damage while work is in progress. In event of damage, immediately make repair to approval of Owner.
 - .3 Where required for excavation, cut roots or branches as approved by Consultant in accordance with Tree and Shrub Preservation.

1.7 SHORING, BRACING AND UNDERPINNING

- .1 Protect existing features in accordance with Section 01560, Temporary Barriers and Enclosures and applicable local regulations.
- .2 Engage services of qualified professional engineer who is registered or licensed in province of Ontario to design and inspect cofferdams, shoring, bracing and underpinning required for work.
- .3 Submit design and supporting data at least 2 weeks prior to commencing work.
- .4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in province of Ontario.
- .5 Professional Engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

1.8 TESTING AND INSPECTIONS

- .1 Inspection and testing of materials and compaction will be carried out by a testing laboratory designated by the Consultant. Costs of tests will be paid under a Cash Allowance by Section 01021, Allowances.
- .2 Frequency of inspections and tests will be determined by Consultant.
- .3 Coordinate proof - rolling and grade verification with Consultant and testing and inspection agency.

2 PRODUCTS

2.1 MATERIALS

- .1 Type 1 fill: OPSS Granular A.
- .2 Type 2 fill: OPSS Granular B. Type 2
- .3 Unshrinkable fill: proportioned and mixed to provide:
 - a) Maximum compressive strength of 0.4 MPa at 28 days.

- b) Maximum Portland cement content of 25 kg/m³.
 - c) Minimum strength of 0.07 MPa at 24 h.
 - d) Concrete aggregates: to CAN/CSA A23.1.
 - e) Portland cement: Type 10.
 - f) Slump: 160 to 200 mm.
- .4 Shearmat: honeycomb type bio degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.
- .5 Geotextiles: filter fabric terra fix 270R as manufactured by Terrafix Geosynthetics.

3 EXECUTION

3.1 SITE PREPARATION

- 1. Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 STRIPPING OF TOPSOIL

- 1. Commence topsoil stripping of areas after area has been cleared of brush weeds and grasses and removed from site.
- .2 Strip topsoil to depths as indicated. Do not mix topsoil with subsoil.
- .3 Stockpile on site. Stockpile height not to exceed 2 m.
- .4 Dispose of unused topsoil to location directed by Consultant off site.

3.3 STOCKPILING

- 1. Stockpile fill materials in areas on site. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.4 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- 1. Construct temporary works to depths, heights and locations as indicated.
- .2 During backfill operation:
 - a) Unless otherwise as indicated or as directed by Consultant, remove sheeting and shoring from excavations.
 - b) Do not remove bracing until backfilling has reached respective levels of such bracing.
 - c) Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.
- .3 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .4 Upon completion of substructure construction:
 - a) Remove cofferdams, shoring and bracing.

- b) Remove excess materials from site and restore water courses as indicated and as directed by Consultant.

3.5 DEWATERING AND HEAVE PREVENTION

1. Keep excavations free of water while work is in progress.
- .2 Submit for Consultant's review details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run off. Pump water from excavations continuously.
- .5 Dispose of water in manner not detrimental to public and private property, or any portion of work completed or under construction.
- .6 Protect soils at footing locations from freezing.
- .7 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.6 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated and as directed by Consultant.
- .2 Excavation must not interfere with normal 45-degree splay of bearing from bottom of any footing.
- .3 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .4 For trench excavation, unless otherwise authorized by Consultant in writing, do not excavate more than 30m of trench in advance of installation operations and do not leave open more than 15m at end of day's operation.
- .5 Dispose of surplus and unsuitable excavated material in approved location outside property limits.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify Consultant when bottom of excavation is reached.
- .9 Obtain Consultant approval of completed excavation.
- .10 Remove unsuitable material from trench bottom to extent and depth as directed by Consultant.
- .11 Correct unauthorized over excavation as follows:

- a) Fill under bearing surfaces and footings with concrete specified for footings.
 - b) Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected maximum dry density.
- .12 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Consultant.
- .13 Install geotextiles as indicated.

3.7 FILL TYPES AND COMPACTION

- .1 If not otherwise indicated in Geotechnical Report, use fill of types specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698.
- a) Exterior side of perimeter walls: use Type 2 fill to subgrade level. Compact to 95 %.
 - b) Within building area: use Type 2 to underside of base course for floor slabs. Compact to 98%.
 - c) Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100 %.
 - d) Retaining walls: use Type 2 fill to subgrade level.
 - e) Place unshrinkable fill in areas as indicated.

3.8 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 See Civil Drawings & Specifications.

3.9 BACKFILLING

- .1 Do not proceed with backfilling operations until Consultant has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfill around installations.
- .6 Place unshrinkable fill in areas as indicated
- a) Place bedding and surround material as specified elsewhere.
 - b) Do not backfill around or over cast in place concrete within 24 hours after placing of concrete.
 - c) Place layers simultaneously on both sides of installed work to equalize loading.
 - d) Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - (1) Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Consultant.
 - (2) If approved by Consultant, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Consultant.

- .7 Install drainage system in backfill as indicated or as directed by Consultant.

3.10 RESTORATION

- .1 Upon completion of work, remove waste materials and debris, trim slopes, and correct defects as directed by Consultant.
- .2 Clean and reinstate areas affected by work as directed by Consultant.
- .3 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

3.11 EXCAVATION, DEWATERING, AND BACKFILL

1. Based on the Occupational Health and Safety Act Regulations for Construction Projects, the soil at this site is classified as Type 3. All excavations greater than 1.2 m in depth must be sloped or shored in accordance with the Occupational Health and Safety Act Regulations for Construction Projects. Short-term (i.e. day) open excavations will be stable above the groundwater table at a temporary angle of 1H:1V, however excavations established at this slope must not be left unattended at any time. Below the prevailing groundwater table, the slopes of open excavations will have to be flattened to 2H:1V or possibly shallower depending upon the method of dewatering employed, or possibly sheeted.

A dry subgrade condition must be maintained at all times during foundation construction until both footing and foundation wall construction, and backfilling, are a sufficient height above the prevailing water table (i.e. at a minimum 1 m). Refer to Geotechnical Report for water table depths. The contractor must undertake to establish the groundwater level in advance of the construction operations such that adequate groundwater control plans can be developed.

The *EPA* requires a person who is engaging in the prescribed water taking activities set out in *O. Reg. 63/16*, that meet the criteria set out in that regulation, to register those activities in the EASR, and possibly obtain a Permit To Take Water.

In fine grained soils, standard groundwater control techniques through the use of sump holes with pumps influences will only a small area. Temporary construction groundwater control in fine grained soils is typically undertaken using oversized excavations and installing perimeter/interior drains/ditches leading to a sufficient number of strategically placed filtered sump holes located in the base of the excavation outside the area of influence of engineered fill and/or foundations. It is noted that the efficiency of conventional sump holes to control the groundwater depends highly upon the number of sumps, the depth of their base below the ultimate subgrade level, method of construction (i.e. cased and filtered sump hole versus a pump at the base of the excavation), and their spacing. In our experience, to be efficient at groundwater control, conventional sump holes should not be placed more than 10 m apart, preferably less, although placement is highly dependent upon soil types (permeability, etc.) and conditions, depth of sump holes, extent/depth of drains/ditches leading to the sumps, as well as the intent of the project. Where greater draw down is required, a more sophisticated dewatering system will be required that will have to be developed by a qualified dewatering subcontractor. In order to be effective any dewatering operation must be started well in advance of the excavating operations and be run continuously throughout the subsurface construction operations.

During construction operations in silty clay excavations, granular backfill can become saturated due to ground/surface water pooling on the surface of the silty clay. This can occur in excavations both inside and outside the structure. The Contractor must undertake to control surface water that develops from precipitation or snow melt that will become

perched on top of the fine grained soils during excavating operations. The groundwater control program designed by the Contractor should account for this during construction operations. At a minimum, weeping tile, leading to a sufficient number of sump pits, should be installed at the surface of the silty clay to allow drainage of the granular fills.

It must be emphasized that, when wet, fine grained soils (such as encountered at this site) can be easily disturbed through excavation operations, foot traffic, etc. and such disturbed soils can lose a significant amount of the native bearing. To minimize the potential for disturbance, the groundwater must be drawn down a sufficient depth below the base of the excavation (i.e. 500 mm to 1 m). In addition, the placement of a working pad of engineered fill or a mudslab overtop of the fine grained soil is strongly recommended.

Ultimately, the method of dewatering will be the choice of the contractor. The importance and benefits of maintaining a dry stable subgrade during excavation and foundation construction cannot be stressed enough. Failure by the contractor to adequately control the groundwater, and/or rainwater, surficial runoff, etc., can result in disturbance to the founding subgrades, which can result in having to carry out corrective measures (i.e. additional excavation, time delays, etc.) to improve the subgrade. Corrective measures required to improve subgrades where groundwater is not adequately controlled will be at the Contractors cost. As part of the Contractors proposed methodology of construction, the Contractor should be requested to submit a dewatering plan prior to commencement of the project that details how they will control groundwater. The plan should include all aspects from methodology (i.e. sump holes and pumps, drainage ditches, vacuum well points), to construction of system (sump hole details, placement, etc.), to operation of system, etc.

When approaching the founding soil subgrade surface, the excavating Contractor should use equipment that will not leave deep gouges in the bearing surface.

It is recommended that a geotextile separating layer, meeting Terrafix 270R or equivalent be placed between any fine grained soil and granular backfills.

The existing silty clays at this Site were not found to meet any OPSS Form 1010 specification and can therefore only be used in areas of landscaping or elsewhere where movement of the ground surface is not of concern.

Any granular material to be used as engineered fill on this site must be tested and approved by this office prior to delivery to the site. It should be noted that engineered fill(s) should be placed in lifts of thickness less than the effective compaction depth of the equipment used to carry out the compaction operations (i.e. if using a heavy diesel Wacker lifts should be a maximum of 300 mm thick, etc.). However, the compaction equipment/method selected by the Contractor must also take into consideration the potential sensitive nature of the native soils such that the compaction operation does not affect the natural structure of the subgrade.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 02770, Concrete Walks, Curbs & Gutters
- .3 Section 03300, Cast in Place Concrete
- .4 Division 09, Flooring & Floor Finishes (for related tactile warning indicators)

1.2 References

- .1 AODA, Ontario Building Code or the National Building Code of Canada,
- .2 CAN/CSA B651 Accessible Design for the Built Environment,
- .3 ISO/FDIS 21542 Building Construction – Accessibility and Usability of the Built Environment and ISO 23599.

1.3 Submittals

- .1 **Product Data:** Submit manufacturer's literature describing products, AODA/OBC certifications, installation procedures and maintenance instructions in accordance with Section 01330, Submittal Procedures.
- .2 **Shop Drawings:** Submit shop drawings in accordance with Section 01330 - Submittal Procedures. Indicate all characteristics of the composite cast-in-place Tactile Warning Indicator, including material, profile, thicknesses, colours, options and installation methods.
- .3 **Samples:** Submit samples in accordance with Section 01330 - Submittal Procedures. Submit two (2) samples of each product to be used. Submit to Departmental Representative material samples at least four weeks prior to commencing work.
- .4 **Material Test Results:** Submit current test reports from qualified, accredited independent testing laboratory in accordance with ASTM guidelines and indicating that materials proposed for use are in compliance with specification requirements and meet the properties indicated. All test reports submitted shall be representative.
- .5 **Closeout Submittals:** Provide manufacturer's operation and maintenance data for each type of Tactile Warning Indicator and accessories.

1.4 Quality Assurance

- .1 Provide composite cast-in-place Tactile Warning Indicator as produced by a single manufacturer with a minimum of five years' experience in manufacturing Tactile Warning Indicator.
- .2 **Installer's Qualifications:** Engage an experienced installer certified in writing by the Tactile Warning Indicator manufacturer, who has successfully completed Tactile Warning Surface Installations similar in material, design, and extent to that indicated for the Contract.
- .3 Cast-in-place Tactile Warning Indicators must be compliant with all Canadian and AODA standards for barrier-free design.

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- .4 Cast-in-place Tactile Warning Indicators shall meet or exceed the following test criteria using the most current test methods:
- .1 Compressive Strength: 28,000 psi minimum, when tested in accordance with ASTM D695.
 - .2 Flexural Strength: 29,000 psi minimum, when tested in accordance with ASTM D790.
 - .3 Water Absorption: Not to exceed 0.10%, when tested in accordance with ASTM D570.
 - .4 Slip Resistance: 1.00 minimum wet/dry static coefficient of friction when tested in accordance with ASTM C1028.
 - .5 Flame Spread: 25 maximum when tested in accordance with ASTM E84.
 - .6 Salt and Spray Performance of Tactile Warning Indicator: No deterioration or other defects after 200 hours of exposure, when tested in accordance with ASTM B117.
 - .7 Chemical Stain Resistance: No reaction to 1% hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, and antifreeze, when tested in accordance with ASTM D543.
 - .8 Abrasion resistance: 500 minimum, when tested in accordance with ASTM C501.
 - .9 Accelerated Weathering of Tactile Warning Indicator when tested by ASTM G155 or ASTM G151 shall exhibit the following result: $\Delta E < 5.0$ at 2,000 hours minimum exposure.
 - .10 Tensile Strength: 11,000 psi minimum, when tested in accordance with ASTM D638.
 - .11 Freeze/Thaw/Heat: No deterioration when tested in accordance with ASTM C1026.

1.5 Delivery, Storage and Handling

- .1 Cast-in-place Tactile Warning Indicators shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings.
- .2 Store Tactile Warning Indicators in an area that is within an acceptable temperature range (4-32 degrees C).
- .3 Maintain storage facility in a clean dry condition to prevent contamination or damage to Tactile Warning Surfaces.

1.6 Guarantee

- .1 Tactile Warning Indicators shall be guaranteed in writing for a period of five (5) years from date of Contract's final completion. The guarantee includes manufacturing defects, breakage and deformation.

2 PRODUCTS

2.1 Materials

- .1 Tactile Warning Indicators
 - .1 Manufactured using a matte finish exterior grade (uniform color throughout thickness of product) with reinforced truncated domes. Slip resistant finishes.
 - .2 Colour: Colour shall be homogeneous throughout Tactile Warning Indicator.
 - .1 Colour to be later selected by Consultant from manufacturer's full colour range.

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- .2 Safety yellow shall be a colour option at no additional cost.
 - .3 Truncated Domes: Square grid pattern of raised truncated domes of 5 mm nominal height, base diameter of 23 mm and top diameter of 11 mm.
 - .4 Dimensions: 305(12") mm wide x maximum practical length.
 - .5 Supply and install product model appropriate for application method.
 - .1 Exterior new cast-in-place concrete entrances, stairs and ramps:
 - .1 Cast in place model.
 - .2 Material: Vitrified polymer composite
 - .3 Model Product: Armor-Tile Cast in Place (ADA-C) or approved equal.
 - .2 Exterior existing concrete and hard surfaces:
 - .1 Surface fastened model.
 - .2 Seal around perimeter with caulking.
 - .3 Model Product: Armor-Tile Surface Applied (ADA-S) or approved equal.
 - .3 Interior and Exterior Stairs, Ramps and Decks constructed with decking composed of wood, composite decking
 - .1 Individual truncated stainless steel domes with crosshatch pattern
 - .2 Model Product: Advantage One (ADV-D-2281-N, Cross Hatch, Stainless Steel).
 - .3 or approved equal.
 - .4 Install suitable blocking or subsurface for fastening.
 - .4 Resilient Flooring and Carpet:
 - .1 Surface applied flexible polymer,
 - .2 3mm or 5mm thickness to match surrounding flooring. Coordinate with Flooring Specifications.
 - .2 Model Product: Eon-Tile Surface Applied (EON-D)
 - .3 or approved equal.
 - .5 Surface applied for applications not otherwise noted.
 - .1 Surface fastened model.
 - .2 Seal around perimeter with caulking.
 - .3 Model Product: Armor-Tile Surface Applied (ADA-S) or approved equal.
 - .6 Acceptable Manufacturer and Product:
 - .1 Armour-Tile Tactile Systems by Kinesik,
 - .2 or approved equal.
 - .2 Tactile Nosing Strips for Ramps, Stairs and Landings.
 - .1 Slip resistant and colour contrasting leading edge strips at the leading edge of all stairs, landings, decks and ramps.
 - .2 Colour: Colour to be later selected by Consultant from manufacturer's full colour range. Safety yellow shall be a colour option at no additional cost.
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- .3 Supply and install product model appropriate for application method.
 - .1 New cast-in-place concrete entrances, stairs and ramps:
 - .1 Cast-in-place concrete insert with tactile anti-slip surface strip.
 - .2 Model Product: S-Series Concrete Nosings by Ecoglo as manufactured by Kinesik, or approved equal.
 - .2 Existing exposed concrete, exposed wood, composite and other surfaces:
 - .1 Surface fastened model.
 - .2 Model Product: N-series Strips by Ecoglo as manufactured by Kenesik, or approved equal.
 - .3 Resilient Flooring: see Flooring Specification for Rubberized Stair Treads and Risers with integral contrast strips. If unspecified:
 - .1 Model Product: RF-series Nosings by Ecoglo as manufactured by Kenesik, or approved equal.
- .3 The Specifications of the concrete, sealants and related materials shall be in accordance with the Contract Documents and the guidelines set by their respective manufacturers.

3 EXECUTION

3.1 Equipment Requirements

- .1 Provide all tools, equipment and services required for satisfactory installation per manufacturer's instruction.

3.2 Preparation

- .1 During all concrete pouring and Warning Indicators installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.
- .2 Coordinate installation with Section 03300, Cast in Place Concrete where applicable.
- .3 The concrete shall be poured and finished, true and smooth to the required dimensions and sloped prior to Warning Indicator placement.

3.3 Installation

- .1 Tactile Warning Indicator will not be allowed to be installed until all submittals have been reviewed and approved by the Consultant.
- .2 Warning Indicators shall be installed as per manufacturer's written instructions.
- .3 To the maximum extent possible, the Warning Indicators shall be oriented such that the rows of in-line truncated domes are parallel with the direction of the ramp. When multiple Warning Indicators regardless of size are used, the truncated domes shall be aligned between the tactile

warning surface tiles and throughout the entire Tactile Warning surface installation.

- .4 The Warning Indicators shall be tamped or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of the Tactile Warning Indicator is flush to the adjacent concrete surface to permit proper water drainage and eliminate tripping hazards between adjacent finishes.
- .5 On Continuous Runs: leave a 3 mm nominal gap between successive Tactile Warning Indicators. As part of the concrete finishing operation, apply 3 mm - 6 mm edge treatment around the perimeter of the Tactile Warning Indicators to facilitate future replacement of the Warning Indicator. A Urethane Sealant such as Sikaflex 1a, BASF NP1, or approved alternate shall be applied to the edge treatment for a watertight installation.

3.4 Cleaning and Protection

- .1 Protect Warning Indicators against damage during construction period to comply with manufacturer's written specifications.
- .2 During and after the Warning Indicator installation and the concrete curing stage, it is imperative that there are no walking, leaning or external forces placed on the Warning Indicators to rock the Warning Indicator, causing a void between the underside of the Warning Indicator and the concrete substrate.
- .3 Remove Protective Plastic Sheeting from Warning Indicator within 24 hours of installation. Particularly under hot weather conditions (27 degrees C or higher), plastic sheeting will adhere strongly (resulting in difficult removal of same) to Tactile Warning Indicator when not removed quickly.
- .4 Clean Warning Indicators not more than four (4) days prior to date of substantial completion in each area of project. Clean Warning Indicators by method specified by Tactile Warning Indicators manufacturer.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 02222, Selective Demolition
- .2

1.2 REFERENCES

- .1 ASTM C 260-95, Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C 309-97, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C 494-92, Specification for Chemical Admixtures for Concrete
- .4 ASTM D 1751-83(1991), Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- .5 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .6 CAN/CSA-A5-93, Portland Cement.
- .7 CAN/CSA-A23.1-04, Concrete Materials and Methods of Concrete Construction.
- .8 CAN/CSA-A23.2-04, Methods of Test for Concrete.
- .9 CAN/CSA-A23.5-98, Supplementary Cementing Materials.
- .10 CAN/CSA A363-98, Cementitious Hydraulic Slag.

2 PRODUCTS

2.1 MATERIALS

- .1 Portland cement to CAN/CSA-A5.
- .2 Supplementary cementing materials: to CAN/CSA-A23.5.
- .3 Cementitious hydraulic slag: to CAN/CSA-A363.
- .4 Water: to CAN/CSA-A23.1.
- .5 Aggregates: to CAN/CSA-A23.1. Coarse aggregates to be normal density.
- .6 Air entraining admixture: to ASTM C 260.
- .7 Chemical admixtures: to ASTM C 494. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing, prior to starting Work. Do not use admixtures containing chlorides.

- .8 Concrete retarders: to ASTM C 494. Do not allow moisture of any kind to come in contact with the retarder film.
- .9 Curing compound: to CAN/CSA-A23.1
- .10 Ribbed waterstops: extruded PVC use 100mm wide in construction joints and 225mm wide with 31mm O.D. centre bulb in expansion joints unless indicated otherwise on drawings.
 - .1 Tensile strength: to ASTM D 412, method A, Die "C", minimum 13.8 Mpa.
 - .2 Elongation: to ASTM D 412, method A, Die "C", minimum 275%.
 - .3 Tear resistance: to ASTM D 624, method A, Die "B", minimum 35 kN/m.
- .11 Bentonite waterstop: Bentonite strip.
- .12 Premoulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D 1751.
 - .2 Sponge rubber: to ASTM D 1752, Type I, firm grade.
- .13 Weep hole tubes: plastic.
- .14 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.
- .15 Polyethylene film: 0.15 mm thickness to CAN/CGSB-51.34.
- .16 Bonding adhesive: synthetic latex

2.2 OTHER MATERIALS

- .1 Grout: Premixed, non-metallic, non-shrink Minimum compressive strength 45 MPa at 28 days.
- .2 Dry pack grout: Use 1:2 mix of Portland cement and concrete sand. Add sufficient water for the mixture to retain its shape when made into a ball by hand. When thickness of grout exceeds 50mm, use 1:1½:2 mix of Portland cement, concrete sand and 10mm pea gravel instead. Compressive strength at 28 days to be 30 MPa.
- .3 Liquid curing/sealing compound: to ASTM C309 Type 1, Class B, water based acrylic, compatible with surface hardener where hardener is used. Ensure that curing/sealing compound is compatible with and will not impair bond of any material laid over it.
- .4 Floor surface hardener: Non-metallic, natural grey colour, premixed, Mohs Hardness 7 or better.
- .5 Coloured floor surface hardener: Non-metallic, colour as specified, premixed, Mohs Hardness 7 or better.
- .6 Pre-moulded joint fillers: Bituminous impregnated fibre board: to ASTM D1751.
- .7 Bonding agent: synthetic latex .
- .8 Control joint filler: semi-rigid filler to protect against slab edge breakdown.

2.3 CONCRETE MIXES

- .1 Use ready-mix concrete. Proportion concrete in accordance with CSA A23.1, Table 11, Alternative 1. Use a water-reducing agent in all concrete. Obtain approval of the Consultant for the use of admixtures other than water-reducing and air entraining agents.
- .2 Supplementary cementing materials: Conform to the directions of the slag and fly ash manufacturers for the proportioning and mixing of concrete.
- .3 Do not use supplementary cementing materials in architectural concrete.
- .4 For columns less than 300mm in least dimension and for walls less than 200mm thick, reduce nominal size of coarse aggregate to 10mm.
- .5 Interior slabs (including slabs on steel deck), beams, walls and columns: Provide normal density concrete to give following properties unless otherwise noted:
 - .1 Class of exposure: N
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: see Structural Drawings
 - .4 Nominal size of coarse aggregate: 20mm. See also clause 2.3.4.
 - .5 Slump at time and point of discharge: 50mm to 110mm
- .6 Footings, piers, pile caps, caisson caps, grade beams and foundation walls : Provide normal density, frost resistant concrete to give following properties:
 - .1 Class of exposure: F-2
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: see Structural Drawings
 - .4 Maximum water/cementing material ratio: 0.55
 - .5 Nominal maximum size of coarse aggregate: 20mm. See also clause 2.3.3.
 - .6 Slump at time and point of discharge: 50mm to 110mm
 - .7 Air content: 4 to 7%
- .7 Lean concrete and mud slabs: Provide normal density concrete to give following properties:
 - .1 Class of exposure: N
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: 10 MPa
 - .4 Nominal maximum size of coarse aggregate: 20mm.
 - .5 Slump at time and point of discharge: 50mm to 110mm
- .8 Exterior, exposed walls and columns exposed to freezing and thawing, but not exposed to chlorides: Provide normal density, frost resistant concrete to give following properties:
 - .1 Class of exposure: F-2
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: see Structural Drawings
 - .4 Maximum water/cementing material ratio: 0.55
 - .5 Nominal maximum size of coarse aggregate: 20mm. See also clause 2.3.3.
 - .6 Slump at time and point of discharge: 50mm to 110mm
 - .7 Air content: 4 to 7%
- .9 Structurally reinforced concrete exposed to chlorides, including grade beams, exterior reinforced

- slabs and parking garage slabs, ramps, columns and walls: Provide normal density concrete to give following properties :
- .1 Class of exposure: C-1
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: 35MPa
 - .4 Maximum water/cementing material ratio: 0.40
 - .5 Nominal maximum size of coarse aggregate: 20mm. See also clause 2.3.3.
 - .6 Slump at time and point of discharge: 50mm to 110mm
 - .7 Air content: 5 to 8%
- .10 Interior slabs-on-grade: Provide normal density concrete to give following properties:
- .1 Class of exposure: N
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: see Structural Drawings
 - .4 Nominal maximum size of coarse aggregate: 20mm. Increase to 40mm where slab-on-grade thickness exceeds 130mm
 - .5 Slump prior to addition of fibres: 50mm to 110mm
 - .6 Plastic fibre additive: apply at rate of 0.9 kg/m³. Add sufficient water reducing agent to restore slump loss.
 - .7 Slump at time and point of discharge, after addition of fibres and plasticizer: 50mm to 110mm.
- .11 Interior and roof concrete toppings, curbs and bases: Provide normal density concrete to give following properties:
- .1 Class of exposure: N
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: 25 MPa
 - .4 Nominal size of coarse aggregate for:
 - .5 Toppings between 25 and 35 mm thick: 10mm
 - .6 Toppings between 35 and 50mm thick: 14mm
 - .7 Thicker toppings: 20mm
 - .8 Slump at time and point of discharge: 20mm to 60mm
 - .9 Where topping is less than 25mm thick, no coarse aggregate is allowed, and a bonding agent shall be provided within the mix and to bond the topping to the substrate.
- .12 Exterior unreinforced slabs, driveways, sidewalks, curbs and gutters, parking slabs on grade: Provide normal density, chloride resistant concrete to give following properties:
- .1 Class of exposure: C-2
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: 32 MPa
 - .4 Maximum water/cementing material ratio: 0.45
 - .5 Nominal maximum size of coarse aggregate: 20mm
 - .6 Slump at time and point of discharge: 50mm to 110mm
 - .7 Air content: 5 to 8%
- .13 Exterior, unreinforced pavements: Provide normal density concrete to give following properties:
- .1 Class of exposure: C-2
 - .2 Cement: Type 10
 - .3 Minimum compressive strength at 28 days: 32 MPa
 - .4 Maximum water/cementing material ratio: 0.45

- .5 Nominal maximum size of coarse aggregate: 20mm
- .6 Slump at time and point of discharge: 40mm to 80mm. Use plasticizer if necessary to increase slump for placement.
- .7 Air content: 5 to 8%

3 EXECUTION

3.1 PREPARATION

- .1 Obtain Consultant's approval before placing concrete. Provide 24 hours' notice prior to placing of concrete.
- .2 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .3 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .4 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .5 Do not place load upon new concrete until authorized by Consultant.

3.2 CONSTRUCTION

- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.
- .2 Sleeves and inserts.
 - .1 No sleeves, ducts, pipes or other openings shall pass through joists, beams, column capitals or columns, except where indicated or approved by Consultant.
 - .2 Where approved by Consultant, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated, must be approved by Consultant.
 - .3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Consultant before placing of concrete.
 - .4 Check locations and sizes of sleeves and openings shown on drawings.
 - .5 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
- .3 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete. Tolerable of anchor bolts is 6 mm.
- .4 Drainage holes and weep holes:
 - .1 Form weep holes and drainage holes in accordance with Section 03100 – Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.
 - .2 Install weep hole tubes and drains as indicated.
- .5 Dovetail anchor slots:
 - .1 Install continuous vertical anchor slot to forms where masonry abuts concrete wall or

- columns.
- .2 Install continuous vertical anchor slots at 800 mm oc where concrete walls are masonry faced.
- .6 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.
- .7 Finishing.
 - .1 Finish concrete in accordance with CAN/CSA-A23.1.
 - .2 Use procedures noted in CAN/CSA-A23.1 to remove excess bleed water. Ensure surface is not damaged.
 - .3 Use curing compounds compatible with applied finish on concrete surfaces.
 - .4 Finish concrete floor to meet requirements of CGSB 81-GP-1M Class 1.
 - .5 Concrete floor to have finish hardness equal or greater than Mohs hardness 7 in accordance with CAN/CSA-A23.1.
- .8 Provide final finish in accordance with proposed use and as follows:
 - .1 Screeded and bull floated for: mud slabs and footings/ pile caps.
 - .2 Screeded and bull floated with scratch finish for: base slabs which receive mortar setting beds or bonded toppings.
 - .3 Powered float finish for: roofs (except future floors) and slabs which receive a membrane.
 - .4 Wood float finish with brooming for: exterior exposed slabs.
 - .5 Powered steel trowel finish for: interior exposed slabs; slabs which receive resilient flooring, carpet, epoxy-based finishes, thin-set tiles, etc.; and future floors.
 - .6 Provide floor surface hardener where hardened concrete is required by the Architectural Drawings or Specifications. Incorporate hardener into the surface of the concrete while concrete is still plastic. Apply at rate of 8 kg per square metre in two shakes applied at right angles.
 - .7 Finish formed surfaces in accordance with CSA A23.1, Clause 24. Completely fill holes left by through-bolts with grout.
 - .8 Do not patch surfaces until instructed in writing by Consultant.
 - .9 Where honeycombing has been cut out in accordance with clause 24.2.5, do not patch until reviewed by Consultant.
 - .10 Provide smooth-form finish for all exposed concrete surfaces.
- .9 Curing And Protection
 - .1 Cure and protect concrete in accordance with CSA A23.1, Clause 21. In addition to Cold-Weather Protection requirements in A23.1, provide protection so that temperature of concrete surfaces is maintained at not less than 21 degrees C for 3 days after placement, not less than 10 degrees C for the next 2 days and above freezing for the next 2 days. Vent exhaust gases from combustion type heaters to atmosphere outside heated enclosure.
 - .2 Cure slab surfaces immediately after finishing is completed. Use a curing compound compatible with applied finishes except where bonded topping to be applied. Where curing compound is not used, cover slab surfaces with absorptive mat or fabric and keep continuously wet.
 - .3 Extend basic curing period until concrete has reached following strength levels for structural safety:
 - .1 Framed slabs and beams: 75% of specified 28 day strength.

- .2 Columns and piers: 75% of specified 28 day strength.
- .3 Pile caps: 75% of specified 28 day strength.
- .4 Walls: 50% of specified 28 day strength.

- .10 Extend basic curing period as required if higher amounts of supplementary cementitious materials are used.
 - .1 Topping mixture to meet 2.3.11
 - .2 Pouring base course, make allowance for topping thickness.
 - .3 Place monolithic topping before base course has completely set in accordance with CAN/CSA-A23.1 and topping manufacturer's recommendations.
 - .4 Place bonded topping over hardener base course in accordance with CAN/CSA-A23.1 and topping manufacturer's recommendations.
 - .5 Follow instructions by Consultant in case conflicting requirements arise between CAN/CSA-A23.1 and manufacturer's recommendations.
 - .6 Apply latex bonding agent modified cement/sand grout to base course in accordance with CAN/CSA-A23.1 and manufacturer's recommendations before placing bonded topping.
 - .7 Observe manufacturer's safety recommendations.
 - .8 Ensure that joints in topping are of the same as those in base course. Also ensure that their locations precisely match those in base course.

- .11 Waterstops.
 - .1 Install waterstops to provide continuous water seal. Do not distort or pierce waterstop in such a way as to hamper performance. Do not displace reinforcement when installing waterstops. Use equipment to manufacturer's requirements to field splice waterstops. Tie waterstops rigidly in place.
 - .2 Use only straight heat sealed butt joints in field. Use factory welded corners and intersections unless otherwise approved by Consultant.

- .12 Joint fillers.
 - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant. 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 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 top of finished slab surface unless indicated otherwise.

3.3 SITE TOLERANCE

- .1 Concrete tolerance in accordance with CAN/CSA-A23.1 straight edge method.

3.4 FIELD QUALITY CONTROL

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Consultant in accordance with CAN/CSA-A23.1 and Section 01450 - Quality Control.
- .2 Pay for costs of tests as specified in Section 01021, Allowances.
- .3 Take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

- .4 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.
- .5 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

3.5 TYPICAL DETAILS

- .1 See drawings.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 00300- Tender Form: Alternative Prices
- .2 Section 01561 - Environmental Protection
- .3 Section 01610 - Basic Product Requirements
- .4 Section 04051 - Masonry Procedures.
- .5 Section 04060 - Mortar and Masonry Grout.
- .6 Section 04080 - Masonry Reinforcing and Connectors.
- .7 Section 04090 - Masonry Accessories.

1.2 REFERENCES

- .1 CAN/CSA 82.1-M87(R1992), Burned Clay Brick
- .2 CAN3-A165 Series-94, Concrete Masonry Units.

1.3 SUBMITTALS

- .1 Product data. In accordance with 01330, Submittal Procedures

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver masonry units in protective film. Prevent damage to units.
- .2 Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.
- .3 Store units in a manner designed to prevent damage and staining of units.
- .4 Stack units on timbers or platforms at least 75 mm above grade.
- .5 Place polyethylene or other plastic film between wood and other finished surfaces of units when stored for extended periods of time.
- .6 Cover stored units with protective enclosure if exposed to weather.
- .7 Do not use salt or calcium-chloride to remove ice from masonry surfaces.

1.5 MOCK-UP

- .1 Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

- .1 Construct sample panel at location indicated or directed, and as follows:
 - .1 Size: 4 feet by 4 feet (1.2 m by 1.2 m).
 - .2 Include all unit types and sizes to be used, and mortar joint treatment.
 - .3 Obtain architect's acceptance of sample panel before beginning construction activities of this section.
 - .4 Do not remove sample panel until construction activities of this section have been accepted by architect.

2 PRODUCTS

2.1 MANUFACTURED UNITS

- .1 Face brick.
 - .1 Acceptable Products:
 - .1 Colour: (x1) colour as later selected from the Contemporary Series
 - Size: Metric Modular
 - Manufacturer: Brampton Brick, or approved equal.

3 EXECUTION

3.1 INSTALLATION

- .1 Bond: stretcher or as indicated
- .2 Coursing height: as indicated.
- .3 Jointing: concave
- .4 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .5 Clean unglazed clay masonry as work progresses.

3.2 CLEANING

- .1 Unglazed clay masonry:
 - .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
 - .2 Scrub with solution of 25 ml trisodium phosphate and 25 ml household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
 - .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
 - .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 published by Brick Institute of America dated Sept./Oct. 1977.
- .2 Glazed Clay Masonry:
 - .1 Upon completion, when mortar has set so that it will not be damaged by cleaning, clean with soft sponge or brush, and clean water. Polish with soft, clean cloths.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Work includes, but is not limited to:
 - .1 Pipe handrails & guards.
 - .2 Lintel supports over openings.
 - .3 Bollards

1.2 REFERENCES

- .1 ASTM A53/A53M-99b, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
- .3 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- .4 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
- .5 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .6 CSA W59-M1998, Welded Steel Construction (Metal Arc Welding).

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

2 PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade300W 350W.
- .2 Steel pipe: to ASTM A53/A53M standard weight, black or galvanized finish as indicated.
- .3 Welding materials: to CSA W59.
- .4 Bolts and anchor bolts: to ASTM A307.
- .5 Stainless steel tubing: to ASTM A269, Type 302 Commercial grade Seamless welded with AISI No4 finish.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164.
- .2 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.
- .4 Bituminous paint: to CAN/CGSB-1.108.

2.4 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.5 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

2.6 ANGLE LINTELS

- .1 Steel angles: galvanized prime painted, sizes as indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.
- .3 Finish: shop painted. Final painting to match room finishes, or as otherwise indicated.

2.7 PIPE RAILINGS

- .1 Steel pipe: formed to shapes and sizes as indicated.
- .2 Galvanize exterior pipe railings after fabrication. Shop coat prime interior railings after fabrication.

2.8 CHANNEL FRAMES

- .1 Fabricate frames from steel, sizes of channel and opening as indicated.
- .2 Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.
- .3 Weld steel strap anchors to channel jamb frame at 1000mm oc.
- .4 Finish: galvanized prime coat painted.

2.12 BOLLARDS

- .1 Fabricate bollards from 6" diameter, 1/4" thick wall, galvanized steel pipe, length as indicated.
- .2 Anchor to concrete footings below frost level.
- .3 Fill pipe with concrete. Taper top surface of concrete to shed water.
- .4 Paint finished product with exterior enamel, two coats.

3 EXECUTION

3.1 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Provide components for building by other sections in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 PIPE RAILINGS

- .1 Install pipe railings for stairs and ramps as indicated.
- .2 Set railing standards in concrete. Grout to fill hole. Trowel surface with smooth rounded top to shed water, with edges flush with perimeter surfaces.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Insulation - Section 07213

1.2 References

- .1 ANSI A208.1, Particleboard, Mat Formed Wood.
- .2 CAN/CGSB-11.3-M87, Hardboard.
- .3 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
- .4 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .5 CSA-B111-1974, Wire Nails, Spikes and Staples.
- .6 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .7 CSA O121-M1978, Douglas Fir Plywood.
- .8 CAN/CSA-O141-91, Softwood Lumber.
- .9 CSA-O151-M1978, Canadian Softwood Plywood.
- .10 CSA-O153-M1980, Poplar Plywood.
- .11 CAN/CSA-O325.0-92, Construction Sheathing.
- .12 CAN3-O437 Series-93, Standards on OSB and Waferboard.
- .13 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber.

1.3 Quality Assurance

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

2 PRODUCTS

2.1 Framing and Structural Materials

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Glued end-jointed (finger-jointed) lumber NLGA Special Products Standard
- .3 Glulam in accordance with Structural Glued-Laminated Timber CAN/CSA-O122.
- .4 Structural Composite Lumber (SCL) in accordance with Evaluation of Structural Composite Lumber Products ASTM D 5456.
- .5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

- .1 S2S is acceptable.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

- .6 At all exposed wood provide concealed fastenings. Concealed fastenings to be engineered by Professional Engineer registered in Ontario.

2.2 Panel Materials

- .1 Douglas fir plywood (DFP): to CSA-O121, standard construction.
- .2 Canadian softwood plywood (CSP): to CSA-O151, standard construction.
- .3 Interior mat-formed wood particleboard: to ANSI 208.1.

2.3 Accessories

- .1 Nails, spikes and staples: to CSA-B111.
- .2 Bolts: 12.5 mm (1/2") diameter unless indicated otherwise, complete with nuts and washers.
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer. Explosive activated fasteners are not approved.

2.4 Fastener Finishes

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work interior highly humid areas pressure-preservative fire-retardant treated lumber.
- .2 Stainless steel: use stainless steel 304 alloy for exposed work.

2.5 Wood Preservative

- .1 Treat lumber and plywood to CSA 080.
- .2 Dry material to maximum moisture content of 19%.
- .3 Surface apply coloured preservative to manufacturer's directions.

2.6 Fire Treated Wood

- .1 Fire retardant treated lumber and plywood: Pressure treat timber and plywood with fire retardant chemicals to meet ULC FR-5 rating.
- .2 Flame Spread: Max. 25 in 30 min. to ULC S102.
- .3 Moisture Content: 19% max.

- .4 Provide material bearing Canadian Wood Preservers Bureau and ULC stamp or label.
- .5 Acceptable Products:
 - .1 Koppers Company Inc.
 - .2 Dricon (Hickson Building Products)
 - .3 Timber Specialties Flame Proof LHC

3 EXECUTION

3.1 Installation

- .1 Comply with requirements of OBC/NBC Part 9 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install subflooring and combined subfloor and underlay with panel end-joints located on solid bearing, staggered at least 800 mm.
 - .1 In addition to mechanical fasteners, floor panels secure floor subflooring to floor joists using glue screws. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.
- .6 Install wall sheathing in accordance with manufacturer's printed instructions.
- .7 Install roof sheathing in accordance with requirements of NBC.
- .8 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.
- .9 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
 - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .11 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .12 Install sleepers as indicated.

- .13 Use caution when working with particle board. Use dust collectors and high quality respirator masks.

3.2 Erection

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.
- .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.3 Schedules

- .1 Roof sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, T&G square edge, 15.9 mm (5/8") thick.
- .2 Exterior wall sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP standard sheathing grade, T&G square edge, thickness noted on drawings.
- .3 Interior wall sheathing:
 - .1 Plywood CSP sheathing grade or PP standard sheathing grade square edge 12.7 mm (1/2") thick or to thickness noted on drawings.
- .4 Electrical equipment mounting boards:
 - .1 Plywood, DFP G1S square edge, 15.9 mm (5/8") thick.
- .5 Solid wood blocking:
 - .1 38mm wide solid wood or Plywood, square edge, 19 mm (3/4") thick. Sizes to suit anchoring for products.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 06200 - Rough Carpentry
- .3 Section 06400 - Architectural Woodwork
- .4 Section 08710 - Door & Finishing Hardware
- .5 Section 10800 - Toilet, Bath and Laundry accessories

1.2 References

- .1 AWMAC Quality Standards for Architectural Woodwork 1991.
- .2 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber 1996.
- .3 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress January 1986.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
- .3 Indicate all materials, thicknesses, finishes and hardware.

1.4 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.

1.5 Delivery, Storage, and Handling

- .1 Deliver, handle, store and protect materials in accordance with Section 01610 - Basic Product Requirements.
- .2 Protect materials against dampness during and after delivery.
- .3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

2 PRODUCTS

2.1 Lumber Material

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CAN/CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC custom premium grade, moisture content as specified.
- .2 Hardwood lumber: moisture content 7% or less in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC premium grade, moisture content as specified to species noted..

2.2 Panel Material

- .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .3 Hardwood plywood: to CSA O115. Type 11 exposed faces architectural grade.
- .4 Poplar plywood (PP): to CSA O153, standard construction.
- .5 Interior mat-formed wood particleboard: to CAN3-O188.1.
- .6 Hardboard: to CAN/CGSB-11.3.
- .7 Medium density fibreboard (MDF): to ANSI A208.2, density 769 kg/m³.

2.3 Accessories

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; plain copper stainless steel finish elsewhere.
- .2 Wood screws: to CSA B35.4 plain stainless steel, type and size to suit application.
- .3 Splines: wood plastic metal.
- .4 Adhesive: recommended by manufacturer.

3 EXECUTION

3.1 Installation

- .1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- .3 Form joints to conceal shrinkage.

3.2 Construction

- .1 Fastening.
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .3 Set 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.
- .2 Standing and running trim.
 - .1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
 - .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
 - .3 Make joints in baseboard, where necessary using a 45° scarf type joint.
 - .4 Install door and window trim in single lengths without splicing.
- .3 Interior and exterior frames.

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- .1 Set frames with plumb sides and level heads and sills and secure.

 - .4 Panelling.
 - .1 Secure panelling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in colour.
 - .2 Secure panelling and perimeter trim using concealed fasteners.
 - .3 Secure panelling and perimeter trim using counter sunk screws plugged with matching wood plugs.

 - .5 Shelving.
 - .1 Install shelving on shelf brackets, at coat racks.
 - .2 Provide 3 mm solid edge-banding on exposed edges.

 - .6 Hardware and Accessories
 - .1 Install all door hardware, miscellaneous hardware and accessories to locations required. See drawings for accessories.

3.3 Schedules

- .1 n/a

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01330 Submittal Procedures
- .2 Section 01450 Quality Control
- .3 Section 01610 Basic Product Requirements
- .4 Section 07900 Joint Sealers
- .5 Section 08800 Glazing
- .6 Section 11603 Stainless Steel Countertops

1.2 References

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A208.2 1994, Density 640-800kg/m³; Medium Density Fiberboard for Interior Use.
 - .2 ANSI A208.1-1993, Density 640-800kg/m³; Grade M2, Particleboard for Interior Use.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 AWMAC Quality Standards for Architectural Woodwork.
- .3 Canadian Standards Association (CSA)
 - .1 CAN3 A172 M79 , High Pressure Paper Base, Decorative Laminates.
 - .2 CSA B111 1974 , Wire Nails, Spikes and Staples.
 - .3 CSA O115 M82 , Hardwood and Decorative Plywood.
 - .4 CSA O121 M1978 , Douglas Fir Plywood.
 - .5 CAN/CSA O141 91 , Softwood Lumber.
 - .6 CSA O151 M78 , Canadian Softwood Plywood.
 - .7 CSA O153 M80 , Poplar Plywood.
 - .8 CAN3 O188.1 M78 , Interior Mat Formed Wood Particleboard.
 - .9 CAN/CGSB 11.3 M87 , Hardboard.
- .4 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress January 1998.
- .5 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 1991.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 Submittal Procedures.
- .2 Indicate details of construction materials, profiles, jointing, fastening finishes and other related details.
- .3 Indicate locations of all service outlets in casework, and all connections, attachments, anchorage and location of exposed fastenings.

1.4 Samples

- .1 Submit samples in accordance with Section 01330 Submittal Procedures.

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- .2 Submit duplicate samples: sample size 300 x 300 mm.
 - .3 Submit duplicate colour samples of laminated plastic or thermofused melamine for colour selection.
 - .4 Submit duplicate samples of laminated plastic joints, edging, cutouts and postformed profiles.

1.5 Delivery, Storage, and Handling

- .1 Protect millwork against dampness and damage during and after delivery.
- .2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

1.6 Warranty

- .1 Submit written warranty against warping, splitting, delamination, or other defects in fabrication and installation in accordance with GC 12.3 for one (1) year.

2 PRODUCTS

2.1 Materials

- .1 Solid Wood and Veneer: clear maple unless otherwise indicated. All woods and veneers to be clear 'quarter cut' and matched.
- .2 Thermofused Melamine (MCP):
 - .1 To NEMA LD-3-95 Grade VGL consisting of a decorative paper impregnated and saturated with melamine resin, thermally fused under heat and pressure to thickness indicated. Always overlay bonded to both faces to prevent warping.
 - .2 Particleboard core panels to ANSI A208.1 - [1993] to ASTM E1333-1990, grade M2, density 640 - 800 kg/m³ to indicated thickness. Colour-matched edging to be 3mm PVC, rounded.
 - .3 Melamine colour to be selected from all manufacturer's group choices solid and wood grain to later Consultant's choices.
 - .4 Supply "Panolam" Brand or approved alternate.
- .3 Softwood lumber: SPF unless specified otherwise, S4S, in accordance with following standards:
 - .1 CAN/CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC custom grade, moisture content as specified.
- .4 Hardwood lumber: Clear Maple or as otherwise indicated, select grade to NHLA standards, kiln dried.
- .5 Plywood: to comply with or exceed requirements of CSA 0115-1987 Type II.
- .6 Particleboard Core: to CAN3-0188.1 - M78; Grade R, sanded faces, 19 mm thick.
- .7 Plastic Laminate: to CAN3-A172-M79, General Purpose Standard Grade (GP-S) for all flat applications and edge banding. Postforming Standard Grade (PF-S) for postformed work. Colours and textures to be selected by Consultant from manufacturers' full range, from "Nevamar", "Formica", or "Wilsonart" and "Arborite" at the Consultants discretion.

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- .8 Stainless Steel Countertops: see Section 11603
 - .9 Quartz:
 - .1 Acceptable Manufacturers: "Caesarstone", "Cambria", "Zodiaq" manufactured by DuPont or approved equal
 - .2 Proponents are permitted to include the products of either of the three specified manufacturers that meet the requirements of Section 06400
 - .3 Dimensions:
 - .1 Thickness: 30mm / 1 ¼" thick
 - .2 Size: Slabs shall be not less than 55" x 120" to minimize the number of joints used in installation.
 - .10 Fasteners and Sealants
 - .1 Nails and staples: to CSA B111.
 - .2 Wood screws: Type and size to suit application.
 - .3 Splines: wood, plastic, or metal.
 - .4 Sealant: to Section 07900 CAN 3.
 - .5 Adhesives: to CSA 0112-M as applicable.
 - .11 Glazing
 - .1 Tempered glazing unless otherwise noted; Thickness as indicated. Refer to Section 08800, Glazing.

2.2 Cabinet Fabrication:

- .1 Cabinet Style: Flush overlay doors and drawers on gable end "European" style construction.
- .2 Case Construction:
 - .1 All joints shall be glued rebate, or glued and dowelled or glued and screwed with appropriate screw connectors approved by Consultant. Plain or nailed butt joints are not acceptable.
 - .2 Case Bodies: 19mm Melamine Component Panels with 3mm matching edge-banding or as otherwise indicated.
 - .3 Backs: 16mm Melamine Component Panels.
 - .4 Doors: 19mm Melamine Component Panels with 3mm matching edge-banding.
- .3 Shelves:
 - .1 Shelving: 19mm Melamine Component Panels with 3mm matching edge-banding.
 - .2 Shelving shall be full depth of cabinets.
- .4 Drawer Construction:
 - .1 All joints to be glued rebate, or glued and dowelled or glued and screwed with appropriate screw connectors approved by Consultant.
 - .2 Drawers to be maximum practical depth.
 - .3 Drawer Interiors (Sides, Backs, Bottoms and False Fronts): 13mm Melamine Components Panels
 - .4 Drawer Fronts: 19mm Melamine Component Panels with 3mm matching edge-banding.
- .5 Valance panels: 19mm Melamine Component Panels with 3mm matching edge-banding.

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- .6 Furring, blocking, nailing strips, grounds and rough bucks and sleepers: Softwood lumber.
 - .7 Wood trims and nosings: Select Grade Hardwood, species indicated.
 - .8 Counters: As indicated on drawings. If not otherwise indicated, assume plastic laminate on particleboard core, post formed where indicated; with wood nosings; and to profiles as detailed.
 - .9 Supply and install cabinet hardware, in quantity required for doors, shelves, and drawers.
 - .10 No exposed fasteners allowed in exposed gable ends.

2.3 Cabinet Hardware

- .1 Door hinges: "European" style, concealed, hinges, self-closing, press formed hinge links, zinc die cast screw on hinge cup inset into door, 3-dimensional independent adjustment, all exposed parts nickel plated, opening angle 110°, for full or half overlay as required, on all units, except lazy susan type on corner folding door units. One pair per door, two pair per full height door. Supply "Hettich Intermat" or approved alternate.
- .2 Drawer Slides: Full extension slides with lift out release. Acceptable Product: "Accuride Full extension by Knappe & Vogt", or approved equal.
- .3 Drawer and Swing Door Pulls: Contemporary metal pulls 145mm (5.7") (typical unless otherwise noted as 273mm on elevations) c/w screw fastening, finish to be "Matte Black - finish #900", product #BP7348128900 by Richelieu or approved alternate.
- .4 Shelf Pilasters: zinc coated KV255 by Knappe and Vogt, full height of gable, recessed in dado flush to face.
- .5 Shelf Supports: zinc coated KV256 by Knappe and Vogt. Supply 20 spare shelf supports.
- .6 Door and Drawer Bumpers: rubber bumpers, 10 mm diameter x 3 mm thick, screwed on. Two per door on drawer. Supply 20 spare bumpers.
- .7 Locks: heavy duty suitable for intended use, supplied by Richelieu. Key all cabinet and drawer locks within a room alike. Supply (5) Master Keys for entire project. Coordinate keying with Consultant.
- .8 Closet Rod: 27mm diameter pre-painted white steel rod with screwed fasteners at each end.
- .9 Open Shelving Components: brackets prefinished silver, "Medium Duty" Richelieu #69912106 and pilaster supports, Richelieu #085 Series, zinc finish.
- .10 Countertop supports: K-R650 Kolossus Heavy-Duty Aluminum Brackets, by Richelieu, or approved equal. 18" x 18" L-shape bracket, colour: white.
- .11 Waste Bin and Recycling Center: Rev-A-Shelf 53WC Series Recycling Center by Richelieu or approved equal, colour: Orion Gray, Dimensions: 14-3/8"w x 19"h
- .12 Base Corner Cabinet Storage System: LeMans II System with Soft-Close Mechanism by Richelieu or approved equal, finish: Anthracite. Refer to interior elevations for applicable dimensions.

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- .13 Base Cabinet Sliding Storage System: Rev-A-Shelf Paper Towel Pullout by Richelieu. Product #448PTHBCS8C or approved equal

2.3 Plastic Laminate Fabrication

- .1 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .2 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm to 3000 mm. Keep joints 600 mm from sink cutouts.
- .3 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .4 Use straight self edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .5 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .6 Apply laminated plastic liner sheet to interior of cabinetry where indicated.

2.4 Thermofused Melamine

- .1 Melamine panels in finished (installed) condition shall show no exposed fasteners on exterior surfaces. Assemble melamine millwork using doweled/wafered-and-glue construction. Only where specified, construction may also include assembly using hardware (ie. screws). For more information consult MDF/Particleboard A From Start to Finish@ documents prepared by The Composite Panel Assoc.

3 EXECUTION

3.1 Installation

- .1 Do architectural woodwork to Custom Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.
- .3 Use draw bolts in countertop joints.
- .4 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .5 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.
- .6 Apply water resistant building paper or bituminous coating over wood framing members in contact with masonry or cementitious construction.

-
- .7 Fit hardware accurately and securely in accordance with manufacturer's directions.
 - .8 Confirm millwork and cove base requirements for each room. See finish schedule.

3.2 Cleaning

- .1 Clean millwork and cabinet work inside cupboards and drawers and outside surfaces .

3.3 Protection

- .1 Protect millwork and cabinet work from damage until final inspection .

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Section 01001, General Requirements

1.2 DESCRIPTION

- .1 Work Included:
 - .1 Supply and installation of membrane air/vapour barrier to walls, roofs, and floors. Includes patching as required.
- .2 Related Work Specified Elsewhere:
 - .1 Excavation and backfill - Section 02200 Earthwork
 - .2 Concrete surfaces - Section 03300 Cast -in-Place Concrete
 - .3 Masonry surfaces - Section 04220 Concrete Unit Masonry
 - .4 Brick ties and accessories - Section 04160 Masonry Reinforcing And Connectors
 - .5 Board insulation - Section 07212 Board Insulation
 - .6 Sealants - Section 07900 Sealants

1.3 SUBMITTALS

- .1 Upon request, submit certified copy of test data from recognized independent testing laboratory confirming performance properties of air vapour and dampproofing specified.
- .2 Submit appropriately sized samples of each membrane, 305mm x 305mm (12" x 12"), for verification of compliance with material specified.

1.4 QUALITY ASSURANCE

- .1 Review work of this section while it progresses with a view to identifying weaknesses or gaps in the air/vapour barrier systems.
- .2 Coordinate the timing and installation of the various air/vapour barrier systems and cladding systems to ensure a complete and integral system of air/vapour barriers.
- .3 Review and ensure continuity of air and vapour retardent membranes at junction of cladding and substrate systems and other construction details.
- .4 If the possibility of discontinuity is discovered bring to the attention of the Consultant for further direction and do not conceal.
- .5 All membranes and accessories shall be applied by a contractor acceptable to the manufacturer. Provide written evidence of such endorsement from the manufacturer when requested.
- .6 Installation of membrane systems shall be inspected prior to, periodically during and upon completion by a representative of the manufacturer to ensure compliance with the specifications and the manufacturers published guidelines. Submit written copies of inspection reports prepared by the representative of the manufacturer to the Consultant prior to concealing membrane.
- .7 Notify Consultant of timing of the work of this section and do not conceal work of this section until work reviewed by Consultant and identified defects corrected.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver all membranes and accessory materials to the project site in original and unopened packaging with manufacturer's labels intact.

- .2 Membrane and accessory materials shall be stored on site in such a manner so as to protect them from precipitation and ground moisture.
- .3 Accessory materials including; sealants, mastics, adhesives and primers, shall be stored at temperatures appropriate to those materials. Consult precautionary statements on product labels for storage and usage instructions before use and make reference to applicable material safety data sheets.
- .4 Pallets of membranes shall not be double stacked.

1.6 JOB CONDITIONS

- .1 The membranes and accessory materials shall be applied at ambient temperatures satisfactory to the manufacturer and under dry conditions only.
- .2 Concrete shall be cured a minimum of 7 days and be free of surface moisture prior to the installation of the dampproofing system. Allow adequate drying time following precipitation as recommended by Manufacturer.
- .3 Prior to the installation, inspect those areas to receive the dampproofing to ensure that they are clean, dry, sound, smooth and continuous.

1.7 REFERENCES

- .1 The membranes as specified herein and their installation, shall conform to and proceed in accordance with any and all codes, standards and practices governing work of the nature described throughout this specification.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Supply only those membrane systems specified herein.
- .2 Alternate systems will only be considered upon written submission during the tender period.
- .3 Verify with all manufacturers the compatibility of products one to the other and report any conflicts to the Consultant.

2.2 MATERIALS

- .1 Vapour barrier under slab-on-grade: Polyethylene film to CAN2-51.33-M80, Type 1, 0.253 mm (10 mil) thick, in largest sheets practical.
- .2 Sheet Air Barrier for framed walls: sheet material fabricated from spun-bonded olefin fibres, permeance rating of 1723 ng/PA-S-m², Tyvek 2 by Dupont Canada, Typar by Remmay or Air-Gard by Fabrene Inc. complete with joint tape, Contractor's Sheathing Tape, Type Y-8086 as manufactured by 3M.
- .3 Air/vapour barrier membrane for cavity walls: "Blueskin T.G." thermofusible air and vapour barrier membrane as manufactured by Monsey Bakor:
 - .1 Membrane: SBS modified bitumen membrane reinforced with non-woven fibreglass specifically designed to be fused to the substrate by heating the lower surface with a propane torch. Membrane shall maintain a minimum thickness of 2.5mm (100 mils) after heat application.
 - .2 Thru-wall flashing membrane: same material as air/vapour barrier membrane.
 - .3 Surface Conditioner: As recommended by the Manufacturer.

- .4 Complimentary tapes/mastics for sealing around penetrations, etc.: as recommended by manufacturer.

- .4 Thru-wall flashing membrane: "Blueskin TWF" by Monsey Bakor self adhesive thru-wall flashing membrane composed of a SBS modified bitumen membrane which is integrally laminated to a yellow cross laminated polyethylene film.

- .5 Polyethylene vapour barrier where indicated:
 - .1 General: Polyethylene film to CAN2-51.33-M80, Type 1, 0.152 mm (6 mil) thick, in largest sheets practical.
 - .2 Around Frame Connections: Polyethylene film to CAN2-51.33-M80, Type 1, (10 mil) thick
 - .3 Vapour Barrier Joint Sealing Tape: Tape with an aggressive permanent adhesive, min. 75 mm wide, Contractors Tape by 3M Company.
 - .4 Sealant: in accordance with Section 07900 - Sealants
 - .5 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes, use Sylvania Electric Equipment No. 1004-VB and 5254-VB, or approved equal coordinate with Division 16.
 - .6 Elastic Flashing: Black artificial rubber flashing not less than 1 mm thick complete with expansion joints, control joints, edge bindings, pipe flashings and other standard accessories. Acceptable Suppliers: Miner Butyl Membrane, or Lexsuco Canada, or Tremco or Dunlop, or Goodyear.

- .6 Foundation wall dampproofing below grade: "Black Knight Foundation Coating and Primer" as manufactured by U.S.E. Hichcon Products Limited; with Drainage Board.
 - .1 Complimentary tapes/mastics for sealing around penetrations, etc.: as recommended by manufacturer.
 - .2 Apply dampproofing to all new and existing foundations to be excavated.
 - .3 Install Drainage Board in front of rigid insulation. Acceptable product shall be drainage board as manufactured Platon or equal.

3 EXECUTION

3.1 VAPOUR BARRIER UNDER SLAB-ON-GRADE

- .1 Use sheets of largest practical size to minimize joints.
- .2 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .3 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.2 AIR/VAPOUR BARRIER PERIMETER CAVITY WALLS

- .1 General
 - .1 Examine all areas to receive the membrane to ensure that they are suitably prepared for its installation. Have deficiencies addressed and corrected prior to commencement of the installation.
 - .2 Surfaces shall be smooth, clean, dry and free of any foreign matter that would otherwise hinder either the adhesion or regularity of the installation.
 - .3 The membrane and accessory materials shall be installed only in suitable weather and where there is no threat of precipitation. For ambient temperatures below 0 deg C (32 deg F), consult manufacturer and obtain approval of Consultant.
 - .4 Primer selection shall be consistent with temperature range expected during installation and the type of membrane. Consult manufacturer.
 - .5 Accessory materials shall be stored at temperatures no less than 4 deg C (40 deg F) and no greater than 38 deg C (100 deg F). Containers shall be resealed after usage.

- .2 Preparation
 - .1 Inspection and Repair
 - .1 Inspect all surfaces to receive the membrane to ensure that they are continuous and free of voids and excessive gaps. Blockwork shall be complete and laid up tight to all framed openings. Report and have corrected any deficiencies.
 - .2 Priming/Surface Conditioning
 - .1 Apply primer/conditioner to poured concrete and other surfaces as recommended by the Manufacturer. Apply in accordance with mixing and application instructions on product labels.
 - .2 Allow primer to dry adequately before proceeding. Allow one (1) hour drying period for primer.
 - .3 To avoid excess pick up of air borne dust once priming has been completed, prime only as much area as can be covered with membrane the same working day, If not covered in the same working day, re-prime.

- .3 Membrane Installation
 - .1 For ease of application cut membrane in lengths of 2-3m (7-10ft).
 - .2 Apply membrane horizontally to the primed blockwork between projecting masonry reinforcing, beginning at the base of the wall area.
 - .3 Each length of membrane shall be installed such that its upper edge runs continuously along the underside of the line of masonry reinforcing. Subsequent sheets applied above shall overlap the sheet below an average of 51mm (2in) immediately below the line of reinforcing. Minimum overlaps shall be 38mm (1 1/2in), for lap deviations below this width please contact manufacturer.
 - .4 An alternate method of installation for the membrane can be employed where the membrane is positioned along the top side of the masonry reinforcing and smoothed upward and into place. By continuing in this manner, the next sheet above will overlap the cuts made in the lower sheet immediately above the line of reinforcing.
 - .5 Since the membrane width appropriate for this application, 450mm, is wider than the typical spacing between the lines of reinforcing, 400mm, it will be necessary to cut the membrane at the location of the tie wires projecting from the wall to enable the membrane to be laid into place.
 - .6 End laps in the membrane as will be incurred in the subsequent lengths that follow, shall

maintain a minimum overlap of 50mm.

- .7 Apply heat to the underside of membrane by propane torch, at the point where the membrane is in contact with the substrate. Apply sufficient heat to make the membrane tacky and press membrane onto the substrate, using a masonry trowel to apply light pressure.
- .8 Cut membrane at ties, heat around tie and use a trowel to form a tight seal around projection.
- .9 All detail work shall be carefully carried out to ensure continuous air tightness of the membrane. Reinforce corners with a piece of membrane and use heated trowel to ensure joints are tight.
- .10 The membrane installation shall continue to a point, which as outlined in the plans and specifications, interfaces with other elements designated as integral to the overall air/vapour barrier system. Ensure compatibility with those components and consult manufacturer for assistance on proper tie-ins.

.4 Details

- .1 Fit membrane tightly around all penetrations through it and seal using mastic.
- .2 Continue the membrane into all openings in the wall area, i.e.: windows, doors, etc., and terminate at a point that will ensure that it will not be visible from the interior and will facilitate continuous seal at windows doors etc.
- .3 The membrane installation shall be tied into and made continuous with all framed openings. Due to the wide range of frame profiles, closures and transitions, a standard detail is not practical, consult manufacturer for assistance on these detail locations.
- .4 Co-ordinate the installation of the membrane with the roofing trade to ensure continuity of the air/vapour seal membrane with the roofing system.
- .5 At the end of each working day apply a bead of mastic along the exposed top edge of the incompleated membranes. Tool the mastic to ensure that it is worked into the surface of the block work.
- .6 Before covering in the membrane, inspect and repair as necessary any punctures, damaged areas or inadequately lapped seams. Repairs shall be made using the membrane appropriately sized to extend a minimum of 102mm (4in) in all directions from the perimeter of the affected area.

3.3 FOUNDATION WALL DAMPPROOFING BELOW GRADE

.1 General

- .1 Examine all areas to receive membrane to ensure that they are suitably prepared for its installation. Have deficiencies addressed prior to the commencement of the installation.
- .2 Concrete surfaces shall be smooth, clean, dry and free of any foreign matter that would otherwise hinder the adhesion or installation procedure.
- .3 Ensure compatibility of membrane and accessories with: curing compounds, preservative treatments, dissimilar membrane systems and adjoining materials. Consult manufacturer's representative for further assistance.

.2 Preparation

- .1 Before applying dampproofing: Seal exterior joints between foundation walls and footings, joints between concrete floor slabs and foundation and around penetrations through dampproofing with sealing compound.

- .3 Application
 - .1 Apply primer to surface at rate of 0.5 l/m²
 - .2 Apply dampproofing in accordance with applicable CGSB standard as follows:
 - .1 Material: CGSb 37-GP-2M use Application CGSB 37-GP-3M
 - .2 Material: CGSb 37-GP-16M use Application CGSB 37-GP-36M
 - .3 Apply continuous uniform coating of dampproofing to foundation walls from 50mm below finished grade, down foundation, over mortar fillet and down footing.
 - .4 Clean-up
 - .1 Promptly as the work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing work.

3.4 POLYETHYLENE VAPOUR BARRIER

- .1 Install sheet vapour barrier on warm side of exterior wall, ceiling and floor assemblies prior to installation of gypsum board to form continuous barrier.
- .2 Use sheets of largest practical size to minimize joints.
- .3 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
- .4 During framing installation, wrap header tracks, slab ends and other constructions requiring installation during framing, using 10 mil polyethylene sheets for later sealing to larger sheets. Seal these connecting pieces to membrane air vapour barrier where required.
- .5 For windows and other wall openings:
 - .1 Cut sheet vapour barrier to form openings and ensure material is lapped and sealed to window frame or other opening frame to form continuous seal.
 - .2 Seal vapour barrier to air barrier and/or membrane air/vapour barrier at all openings.
- .6 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Install staples through lapped sheets at sealant bead into wood substrate.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .7 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
- .8 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
 - .1 For sheet-type vapour barriers, install moulded box vapour barrier.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

3.5 SHEET AIR BARRIER

- .1 Attach sheet air barrier vertically to exterior face of sheathing as recommended by manufacturer.
- .2 Lap all horizontal and vertical joints 200mm minimum.

- .3 Ensure continuous placement of sheet air barrier.
- .4 Seal all joints in sheet air barrier with specified sealing tape.
- .5 Where air barrier contacts other insulation or air barrier type, lap a minimum of 200mm and seal with tape.
- .6 Seal air barrier and vapour barrier to each other at all openings.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 02223 - Excavation and Backfill
- .3 Section 07160 - Sheet Vapour Retarder
- .4 Section 07620 - Sheet Metal Flashing & Trim
- .5 Section 07930 - Foamed in Place Insulating Sealant

1.2 REFERENCES

- .1 ASTM E96-96, Test Methods for Water Vapor Transmission of Materials.
- .2 ASTM C591-94, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal
- .3 CGSB 71-GP-24M-77, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 CAN/ULC-S701-97, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
- .5 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01330 - Submittal Procedures.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01330 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Co-ordinate with other building subtrades.
- .3 Review manufacturer's installation instructions and warranty requirements.

2 PRODUCTS

2.1 INSULATION

- .1 Extruded polystyrene: to CAN/ULC S701-97, Type 2 thickness as indicated on drawings with shiplapped edges unless otherwise noted. Only polystyrene insulations listed on CGSB Qualified Products List (41 GP Series) are acceptable for use on this project.
 - .1 Acceptable materials:
 - .1 Below Grade: Styrofoam SM (Type 4) by Dow Chemicals Canada Inc. or approved equal.
 - .2 Exterior walls (Steel Stud/Masonry), (Steel stud/ girts/metal cladding): Styrospan (Type 3) squared edges by Dow Chemicals Canada Inc. or approved equal.

.3 Exterior walls (Masonry Cavity Wall): Cavitymate (Type 3) squared edges by Dow Chemicals Canada Inc. or approved equal.

.2 Insulating sealant: Foam in place to section 07930

2.2 ADHESIVES

.1 Type A: for polystyrene below grade insulation against foundation walls:
.1 to CGSB 71-GP-24.

.2 Type C: Trowel consistency solvent type adhesive for rigid insulation:
.1 to CGSB 71-GP-24 Type 2.
.2 Acceptable Product: Bakor 230-21

2.3 ACCESSORIES

.1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self-locking type.

3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 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 around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50mm from vents.
- .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. On wall applications offset vertical joints to facilitate installation of masonry reinforcement and girt systems..
- .7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

1. Examine substrates and immediately inform Consultant in writing of defects.
2. Prior to commencement of work ensure substrates are firm, straight, smooth, dry, clean, and free of snow, ice or frost and clean of dust and debris.

3.4 RIGID INSULATION INSTALLATION

1. Install insulation board to thickness shown at locates indicated on Drawings and Details.
2. Apply adhesive to polystyrene, insulation board in accordance with manufacturer's recommendations.
3. Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.
4. Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm polyethylene strip over expansion and control joints using compatible adhesive before application of insulation.

3.5 PERIMETER FOUNDATION INSULATION

- .1 Interior application: extend boards vertically below bottom of finish floor slab as indicated on drawings, installed on inside face of perimeter foundation walls. Install on interior face of perimeter foundation wall with adhesive.
- .2 At intersection of perimeter foundation wall and interior foundation walls turn insulation onto one side of the interior wall, as indicated on drawings.
- .3 Under slab application: extend layers of boards from perimeter foundation wall as indicated on drawings. Install layer below underslab area as indicated.

3.6 WALL INSTALLATION

- .1 Install polystyrene insulation boards on outer surface of inner wythe of wall cavity over impaling clips on bed of adhesive. Each layer of insulation shall receive insulation adhesive and joint seal installed as indicated. Apply insulation adhesive to insulation boards with 50 mm daubs of adhesive spaced approximately 305 mm o.c. Both ways on inside face of insulation board.
- .2 Apply a minimum 6 mm wide application of adhesive to board edges by trowel buttering. Seat insulation edge into adhesive and press insulation firmly in place over masonry ties.
- .3 Fit insulation between wall ties and other obstructions with joints staggered and edges butted tightly.
 - .1 Press units firmly against inside wythe of masonry or other construction.
 - .2 Wedge insulation from outside wythe of construction with small fragments of masonry materials spaced 600mm o.c. both ways.
 - .3 Make insulation continuous. Fill all voids with low expansion foam.

3.7 STEEL STUD/MASONRY AND STEEL STUD/CLADDING INSTALLATION

- .1 For installation of insulation boards on gypsum substrates with masonry ties. Supply 50 mm (2") daubs of adhesive spaced approximately 305 mm o.c. both ways on inside face of insulation board and apply a minimum 6 mm wide application of adhesive to board edges. Install insulation over masonry ties and press firmly into place ensuring that insulation edges are firmly seated into joint sealant. Seal around masonry tie using foamed in place insulating sealant and install insulation supports and V-ties onto masonry tie. To further fasten insulation to gypsum board substrate, install a minimum of 2 insulation washers horizontally at midpoint of each insulation board with galvanized screws.
- .2 For installation of insulation boards on gypsum substrates with horizontal system and paneled or metal, install insulation between horizontal girts. Insulation should sit flat against gypsum sheathing with no air gaps. Seal insulation to horizontal girts system. Cut inner layer of insulation board tight around clips and fill voids with foamed in place insulating sealant. Supply 50 mm daubs of adhesive spaced approximately 305 mm o.c. both ways on inside face of insulation board and using minimum 6 mm wide application of Air-Bloc 21 to board edges. Fasten insulation board to metal studs using 4 (four) specified insulation fasteners per sheet.

3.8 PROTECTION

- .1 After installation of board insulation and prior to installation of exterior wall finish, protect insulation from physical damage and exposure to ultra violet sun damage per manufacturer's instructions.

3.9 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 06100: Rough Carpentry
- .3 Section 09250: Gypsum Board
- .4 Division 23: Insulation for mechanical work.

1.2 REFERENCES

- .1 ASTM C 665, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction.
- .2 CAN/ULC S702 1997 Thermal Insulation Mineral Fibre for buildings.
- .3 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC•S702, Standard for Mineral Fibre Insulation.

1.3 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01330 - Submittal Procedures.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01330 - Submittal Procedures. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

2 PRODUCTS

2.1 INSULATION

- .1 Batt and blanket mineral fibre: to ASTM C 665, Type 1 and 2,
 - .1 Acceptable material for Acoustic Insulation:
 - .1 Owens Corning: Quietzone
 - .2 John Mansville: Sound-Sheild Fibreglass Insulation
 - .3 or approved equal
 - .2 Acceptable material for Thermal Insulation: all insulation batts to suit full wall cavity as per Wall/Partition Type.
 - .1 Owens Corning: Ecotouch Thermal Insulation
 - .2 Roxul: ComfortBatt Thermal Insulation
 - .3 John Manville: Thermal Insulation
 - .4 or approved equals.

3 EXECUTION

3.1 INSULATION INSTALLATION

- .1 Install insulation to maintain continuity of thermal and acoustic protection to building elements and spaces unless specifically indicated on drawings all acoustic batt insulation shall extend from the floor to underside of structure floor or roof deck above.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures.
- .5 Do not enclose insulation until it has been inspected and approved by Consultant

3.2 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 The General Conditions of the Contract, Supplementary Conditions, and the General Requirements of Division 1, form part of this section, and must be read in conjunction with the requirements of this section, and all related sections.
- .2 The work of this section, and related work specified in other sections shall comply with all requirements of Division 1 – General Requirements.

1.2 SECTION INCLUDES

- .1 Provision of all labour, materials, equipment and incidental services necessary to provide firestop products and systems intended to act as a firestop and smoke seal within fire resistive wall and floor assemblies.
- .2 Firestop systems shall be used in locations including, but not limited to, the following:
 - .1 Penetrations through fire resistance rated floor and roof assemblies including both empty openings and openings containing penetrants.
 - .2 Penetrations through fire resistance rated wall assemblies including both empty openings and openings containing penetrants.
 - .3 Membrane penetrations in fire resistance rated wall assemblies where items penetrate on side of the barrier.
 - .4 Joints between fire resistance rated assemblies.
 - .5 Perimeter gaps between rated floors/roofs and an exterior wall assembly.
- .3 Firestops and smoke seals within mechanical and electrical assemblies (i.e. inside ducts, dampers and bus ducts) shall be provided as part of the work of Divisions 15 and 16 respectively.
- .4 Firestops and smoke seals around the outside of such mechanical and electrical assemblies, where they penetrate fire separations, shall form part of the work of this section.
- .5 Firestop systems provide for the Work must be from one manufacturer only, whether provided by Divisions 15, 16, or by this section

1.3 RELATED SECTIONS

- | | | |
|-----|---|----------------|
| .1 | Cast-in-Place Concrete | Section 03300 |
| .2 | Unit Masonry | Section 04200 |
| .3 | Structural Steel for Building | Section 051223 |
| .4 | Sprayed Fireproofing | Section 07811 |
| .5 | Intumescent Thin Film Fire Resistive Material | Section 07814 |
| .6 | Sealants | Section 07900 |
| .7 | Aluminum Frame Curtain Wall | Section 08900 |
| .8 | Gypsum Board | Section 09250 |
| .9 | Mechanical; Pipe and Duct | Division 15 |
| .10 | Electrical Lighting, Power, Alarms, and Communication | Division 16 |

1.4 QUALITY ASSURANCE

- .1 Applicator Qualifications
 - .1 Work of this section shall be performed by applicators having a minimum of 2 years documented experience in the installation of firestop products and systems. Submit proof of experience to Consultant.
- .2 Installation
 - .1 Work shall be performed in strict accordance with manufacturer's printed instructions, and in accordance with all warranty requirements.
- .3 Pre-installation Meeting
 - .1 Convene a pre-installation meeting for the Products specified in this section. Attendees must include, as a minimum, representatives of the following:
 - .1 Contractor (Site Superintendent & Project Manager),
 - .2 Installation Subcontractor (Site Foreman & Project Manager),
 - .3 Product Manufacturer and Distributor (Technical Representatives),
 - .4 Related Subcontractors (ie. Mechanical and/or Electrical), and
 - .5 Consultant.

1.5 REFERENCE STANDARDS

- .1 ASTM E84-01; Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 ASTM E119; Methods of Fire Tests of Building Construction and Materials.
- .3 ASTM E814-00; Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- .4 ASTM E1399-97 (2000); Test Method for Cyclic Movement and Measuring Minimum and Maximum Joint Width.
- .5 ASTM E1966-00; Test Method for Resistance of Building Joint Systems
- .6 UL 263; Fire Tests of Building Construction and Materials.
- .7 UL 723; Surface Burning Characteristics of Building Materials.
- .8 UL 1479; Fire Tests of Through-Penetration Fire Stops.
- .9 UL 2079; Tests for Fire Resistance of Building Joint Systems.
- .10 ULC-S115-1995 (R2001); Fire Tests of Firestop Systems.
- .11 CAN/ULC-S102-1988 (R2000); Surface Burning Characteristics of Building Materials and Assemblies.
- .12 Underwriters Laboratories of Canada; List of Equipment and Materials - Fire Resistance.
- .13 Underwriters Laboratories Inc.; Fire Resistance Directory – Volume 2.
- .14 Intertek Testing Services; Directory of Listed Building Products.
- .15 Factory Mutual Research (FM); FM Approval Standard of Firestop Contractors – Class 4991.
- .16 Omega Point Laboratories (OPL); Building Products, Materials & Assemblies – Volume II.

1.6 DEFINITIONS

- .1 Firestop: The use of a material or combination of materials in a fire-rated structure (wall or floor) where it has been breached, so as to restore the integrity of the fire rating on that wall or floor.
- .2 System: The use of a specific firestop material or combination of materials in conjunction with a specific wall or floor construction type and specific penetration(s).
- .3 Barrier: Any bearing or non-bearing wall or floor that has an hourly fire and smoke rating.
- .4 Through-Penetration: Any penetration of a fire-rated wall or floor that completely breaches the

barrier.

- .5 Membrane-Penetration: Any penetration in a fire-rated wall that breaches only one side of the barrier.
- .6 Fire Resistive Joint: Any gap, joint, or opening, whether static or dynamic, between two fire rated barriers including where the top of a wall meets a floor; wall edge to wall edge applications; floor edge to floor edge configurations; floor edge to wall.
- .7 Perimeter Barrier: Any gap, joint, or opening, whether static or dynamic, between a fire-rated floor assembly and a non-rated wall assembly.

1.7 PERFORMANCE REQUIREMENTS

- .1 Penetrations: Provide through-penetration firestop systems that are produced and installed to resist the spread of fire, passage of smoke and other hot gases according to requirements indicated, to restore the original fire-resistance rating of assembly penetrated.
- .2 Provide and install complete penetration firestop systems that have been tested and approved by nationally accepted testing agencies per ASTM E814, UL 1479, or ULC-S115 fire tests in a configuration that is representative of field conditions.
- .3 F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, to ASTM E814, UL 1479, or ULC-S115 but not less than one (1) hour or the fire resistance rating of the assembly being penetrated.
- .4 FT-Rated Systems: Provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .5 FH-Rated Systems: Provide through-penetration firestop systems with H-ratings indicated, as well as F-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .6 FTH-Rated Systems: Provide through-penetration firestop systems with H-ratings indicated, as well as F-ratings and T-ratings, to ASTM E814, UL 1479, or ULC-S115, where required by the Building Code.
- .7 For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
- .8 For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- .9 Fire Resistive Joints: Provide joint systems with fire resistance assembly ratings indicated, as determined by UL 2079 (ASTM E1399 and E1966), but not less than the fire resistance assembly rating of the construction in which the joint occurs. Firestop assemblies must be capable of withstanding anticipated movements for the installed field conditions.
- .10 For firestop assemblies exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
- .11 For floor penetrations exposed to possible loading and traffic, provide firestop systems capable of

supporting floor loads involved either by installing floor plates or by other means.

- .12 Firestop products shall have flames spread ratings less than 25 and smoke-developed ratings less than 450, to ASTM E 84 or CAN/ULC-S102.
- .13 Where there is no specific third party tested and classified firestop system available for an installed condition, the firestop contractor shall obtain from the firestop material manufacturer an Engineering Judgment (EJ) to be submitted to the Consultant and authorities having jurisdiction for approval prior to installation. The EJ shall follow International Firestop Council (IFC) guidelines.

1.8 MOCK-UP

- .1 Prepare sample joints for approval by the Consultant, representative of each type of firestop condition in accordance with Section 01300.
- .2 Where not approved by the Consultant, remove and replace sample joints to the satisfaction of the Consultant.
- .3 Approved installations may become part of the finished work.

1.9 SUBMITTALS

- .1 Product Data: For each type of firestop product selected. Certify that firestop materials are asbestos free and contain volatile organic compounds (VOC's) within limits of the local jurisdiction.
- .2 Design Listings: Submit system design listings, including illustrations, from a qualified testing and inspecting agency that is applicable to each firestop configuration.
- .3 Where there is no specific third party tested and classified firestop system available for a particular configuration, the firestop contractor shall obtain from the firestop material manufacturer an Engineering Judgment (EJ) for submittal.
- .4 Qualification Data: For firms and persons specified under Quality Assurance to demonstrate their capabilities and experience. Submit document from manufacturer wherein manufacturer recognizes the installer as qualified.

1.10 ENVIRONMENTAL CONDITIONS

- .1 Install firestops when ambient or substrate temperatures are within limits permitted by the manufacturer's written instructions. Do not install firestops when substrates are wet due to rain, frost, condensation, or other causes.
- .2 Ventilate per the manufacturers written instructions on the product's Material Safety Data Sheet.

1.11 COORDINATION

- .1 Coordinate construction of openings and penetrating items to ensure that firestop assemblies are installed according to specified requirements.
- .2 Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

- .3 Do not conceal firestop installations until the Owner's inspection agency or Authorities Having Jurisdiction have examined each installation.
- .4 Schedule firestop work after installation of penetrants but prior to concealing the openings.

1.12 EXTENDED WARRANTY

- .1 Submit a warranty of the firestop installation specified in this Section covering a period of an additional two years beyond the expiration of the warranty period specified in the General Conditions of the Contract, including materials and application. Replacement of firestop shall include removal of defective materials, preparation for and application of new material, and the repair and making good of damaged adjacent materials.
- .2 "Defective" firestop installation shall include; joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, sagging, loss of adhesion, loss of cohesion, and staining of adjacent finished materials or surfaces.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- .1 3M Fire Protection Products
- .2 A/D Fire Protection
- .3 Hilti Firestop Systems
- .4 Grace Construction Products
- .5 TREMstop Firestopping Systems

2.2 MATERIALS

- .1 Firestop And Smoke Seal Systems: in accordance with ASTM E814, UL 1479, or ULC-S115, asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke, and gases to ASTM E814, UL 1479, or ULC-S115, and not to exceed opening sizes for which they are intended.
- .2 Service Penetration Assemblies: certified in accordance with ASTM E814, UL 1479, or ULC-S115 and listed in testing laboratory directory.
- .3 Service Penetration Firestop Components: certified in accordance with ASTM E814, UL 1479, or ULC-S115 and listed in testing laboratory directory.
- .4 Fire resistance rating of installed firestop assemblies shall be in accordance with design requirements, and requirements of Ontario Building Code.
- .5 Primers: to Firestop manufacturer's recommendation for specific material, substrate, and end use.
- .6 Intumescent Firestop Sealants and Caulks
 - .1 Grace FlameSafe FS1900.
 - .2 Hilti FS-One.
 - .3 A/D FIREBARRIER Intumescent Caulk.
 - .4 3M Fire Barrier CP 25WB+ Caulk.

- .5 TREMstop IA by, TREMstop Firestopping Systems.

- .7 Elastomeric Sealant
 - .1 Grace FlameSafe FS1900, FS900+.
 - .2 Hilti CP601S.
 - .3 A/D FIREBARRIER Seal/Seal NS.
 - .4 3M Fire Barrier Sealant 2000 and 2000N/S.
 - .5 Fyre-Sil/Fyre-Sil S/L by, TREMstop Firestopping Systems.

- .8 Joint Spray
 - .1 Grace FlameSafe FS3000.
 - .2 Hilti CP672.
 - .3 A/D FIREBARRIER SprayMastic.
 - .4 3M FireDam Spray 100.
 - .5 TREMstop Acrylic SP by, TREMstop Firestopping Systems.

- .9 Firestop Putty
 - .1 Grace FlameSafe FSP1000 Putty & FSP1077 Putty Pads.
 - .2 Hilti CP617/617L Putty Pads, & CP618 Putty Stick.
 - .3 A/D FIREBARRIER Putty.
 - .4 3M Fire Barrier Moldable Putty+.
 - .5 TREMstop MP by, TREMstop Firestopping Systems.

- .10 Firestop Devices
 - .1 Grace FlameSafe FSWS Collar, FSIS Intumescent Sleeve.
 - .2 Hilti CP642/643 Collar.
 - .3 A/D FIREBARRIER Collar/Sleeve.
 - .4 3M Fire Barrier RC-1 Restricting Collar.
 - .5 Fyre-Can/Fyre-Can Sleeve by, TREMstop Firestopping Systems.

- .11 Wrap Strips
 - .1 Grace FlameSafe FSWS 100/150.
 - .2 Hilti CP645.
 - .3 AD FIREBARRIER Wrap Strip.
 - .4 3M FS-195+.
 - .5 TREMstop WS by, TREMstop Firestopping Systems.

- .12 Firestop Mortars
 - .1 Grace FlameSafe FSM Mortar.
 - .2 Hilti FS635 Trowelable Compound.
 - .3 A/D FIREBARRIER Mortar.
 - .4 3M Fire Barrier Mortar.
 - .5 TREMstop Fire Mortar by, TREMstop Firestopping Systems.

- .13 Firestop Bags/Pillows/Blocks
 - .1 Grace FlameSafe Bags, FlameSafe Pillows.
 - .2 Hilti FS657 Fire Block.
 - .3 AD FIREBARRIER Pillows.
 - .4 3M Fire Barrier Pillows.
 - .5 TREMstop PS by, TREMstop Firestopping Systems.

- .14 Forming/Damming Materials: Mineral Wool or other type as per manufacturer's recommendations.

- .15 Accessories: Provide components for each firestop system that are needed to install fill materials and to comply with Performance Requirements. Use only approved components specified by the firestop manufacturer for the firestop systems indicated. Accessories include, but are not limited to the following items:
- .1 Permanent forming/damming/backing materials, including the following:
 - .2 Mineral wool fiber insulation.
 - .3 Foams or sealants used to prevent leakage of fill materials in liquid state.
 - .4 Fire-rated form board.
 - .5 Polyethylene/polyurethane backer rod.
 - .6 Rigid polystyrene board, and other temporary forming materials.
 - .7 Substrate primers.
 - .8 Steel sleeves.
- .16 All firestop products and systems shall be designed and installed so that the basic sealing system will allow the full restoration of the thermal and fire resistance properties of the barrier being penetrated with minimal repair if penetrants are subsequently removed.

2.3 MIXING

- .1 For those products requiring mixing before application, comply with firestop manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

3 EXECUTION

3.1 EXAMINATION

- .1 Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.
- .2 Proceed with installation only after unsatisfactory conditions have been corrected.
- .3 Verify that all pipes, conduits, cables, and/or other items which penetrate fire-rated construction have been permanently installed prior to installation of firestops.

3.2 PREPARATION

- .1 Surface Cleaning: Clean out openings immediately before installing firestop systems to comply with written recommendations of firestop manufacturer and the following requirements:
- .1 Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of firestop systems.
 - .2 Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestop systems. Remove loose particles remaining from cleaning operation.
 - .3 Remove laitance and form-release agents from concrete.
- .2 Firestop shall be installed before fireproofing where bonding of firestop to metal deck is required.

- .3 Firestop must precede installation of insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.3 INSTALLATION

- .1 General
 - .1 Install firestop and smoke seal material and components in accordance with certification and manufacturer's instruction.
 - .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separations.
 - .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength to maintain their integrity.
 - .4 Tool or trowel exposed surfaces to a neat smooth finish.
 - .5 Remove excess compound promptly as work progresses and upon completion.
- .2 Penetration Firestop Systems
 - .1 Install through-penetration firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install forming/damming/backing materials and other accessories required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire resistance ratings required.
 - .4 Install fill materials for firestop systems by proven techniques to produce the following results:
 - .1 Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - .2 Apply materials so they fully contact and adhere to substrates formed by openings and penetrating items.
 - .3 For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- .3 Joint Firestop Systems
 - .1 Install fire resistive joint firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install joint forming/damming materials and other accessories required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths of installed firestop material relative to joint widths that allow optimum movement capability and achieve fire resistance ratings required.
 - .4 Install fill materials for firestop systems by proven techniques to produce the following results:
 - .1 Fill joint as required to achieve fire-resistance ratings indicated.
 - .2 Apply materials so they fully contact and adhere to substrates forming the openings.
 - .3 Completely fill recesses provided for each joint configuration.
 - .4 Tool non-sag firestop materials after their application and prior to the time

skinning begins. Use tooling agents approved by the firestop manufacturer.

- .4 Perimeter Barrier Firestop Systems
 - .1 Install perimeter barrier firestop systems to comply with Performance Requirements in Part 1 and firestop manufacturer's written installation instructions and published drawings for products and applications indicated.
 - .2 Apply firestops in accordance with listed system designs or manufacturer's EJ per the manufacturer's installation instructions.
 - .3 Install metal framing, curtain wall insulation, mechanical attachments, safing materials and firestop materials as applicable within the system design.

3.4 INSPECTION

- .1 Notify Consultant when installation is complete and ready for inspection, and prior to concealing or enclosing firestop materials and service penetration assemblies.

3.5 TOLERANCES

- .1 The following shall regulate sizing of service penetrations:
 - .1 Divisions 15 and 16 shall sleeve single, circular penetrants, except in fire resistance rated gypsum board.
 - .2 Multiple penetrations of circular penetrants shall be considered such if the penetrants are not further than 102mm apart.
 - .3 Forming of multiple penetrations and single penetrants in fire resistance rated gypsum board assemblies shall be created by respective trades by forming a square or rectangular opening around the penetrants. The edges of the opening shall be covered in gypsum board
 - .4 Perimeter clearance shall be 13mm to 25mm for single penetrants, or 13mm to 25mm around outer penetrants in multiple penetrations.
 - .5 Penetrations of square or rectangular configuration shall be constructed as specified above. Perimeter clearance shall be 40 to 50mm.

3.6 SCHEDULE

- .1 Non-Service Penetrations Through Vertical Fire Separations Consisting of Masonry, Concrete, Or Gypsum Board/Stud Construction;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .2 Edge of Floor Slabs At Curtain Wall Or Precast Concrete Panel Assemblies;
 - .1 Self-leveling elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .3 Voids at Perimeter Edges of Vertical Fire Separations Consisting Of Masonry, Concrete, Or Gypsum Board/Steel Stud Construction;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.
- .4 Intersection of Masonry and Gypsum Board/Steel Stud Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.

- .5 Control and Deflection Joints in Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.

- .6 Non-Service Penetrations Through Horizontal Fire Separations And Fire-Resistance Rated Floor Slabs.
 - 1 Self-leveling elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.

- .7 Openings and Sleeves Installed for Future Use in Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **FH**.

- .8 Service Penetrations Around Mechanical Ductwork And Noncombustible Piping, Rigid Electrical Conduit And Other Assemblies Penetrating Fire Separations;
 - .1 Elastomeric seal and backup/forming material.
 - .2 Firestop system rating: **F**.

- .9 Service Penetrations Around Combustible Piping Penetrating Fire Separations;
 - .1 Intumescent mastic collar.
 - .2 Firestop system rating: **F**.

- .10 Service Penetrations Around Multiple Flexible Cables Penetrating Fire Separations;
 - .1 Removable intumescent bags/pillows, or intumescent cable sleeve systems.
 - .2 Firestop system rating: **FT**.

3.7 CLEANUP

- .1 Remove excess materials and debris from site, and clean adjacent surfaces immediately after application.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Division 01 – General Requirements
- .2 Section 07481 – Preformed Metal Cladding
- .3 Section 07541 – Single Ply PVC Roofing

1.2 References

- .1 CSSBI 20M-99 Sheet Steel for Architectural, Industrial and Commercial Building Applications.
- .2 CSSBI 16-94 Pre-finished Sheet Steel for Building Construction
- .3 ASTM A653M-99 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 CAN/CGSB-19.18-M87 Sealing Compound, One-Component, Silicone Base, Solvent Curing.

1.3 Design Criteria

- .1 Design metal panel wall 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 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
- .3 Design members to withstand dead load and wind loads calculated in accordance with NBC applicable local regulations, to maximum allowable deflection of 1/180th of span.
 - .1 Components shall not vibrate and shall be free of all noise when exposed to design wind loads.
- .4 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall.
- .5 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.
 - .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75mm.
- .6 Appearance:
 - .1 All exposed surfaces shall be free of distortion, twist, waves, kinks and buckles.
 - .2 Colour shall be uniform hue, tint, shade and gloss.

1.4 Shop Drawings

- .1 Submit shop drawings in accordance with requirements of Section 01330
- .1 Indicate dimensions and profiles.

2 PRODUCTS

2.1 Materials

- .1 Pre-coated Galvanized Steel: ASTM A525, Z275 zinc coating; 0.6 mm core steel, shop pre-coated with 8000 series coating, colour as selected by Architect. Allow (1) colour.
- .2 Galvanized Steel: ASTM A525, Z275 zinc coating; 0.6 mm core steel.
- .3 Exterior corners: of same profile, material and finish as adjacent siding material, shop cut and brake formed to required angle, concealed corner brace, concealed fasteners.
- .4 Exposed joint (perpendicular to profile): ends of siding sheet shop cut clean and square, backed with tight fitting filler lapping back of joint.

2.2 Components

- .1 Fascia: profiles as indicated.
- .2 Gutters: Square profile 150 mm wide x 150 mm deep
 - .1 Anchorage Devices: Type recommended by fabricator.
 - .2 Gutter Supports: Brackets or Straps, as is appropriate, maximum spacing apart 1000mm.
- .3 Downspouts: Rectangular closed face profile; 100 mm x 100 mm.
 - .1 Downspout supports: Straps, as is appropriate, maximum spacing apart 1800mm.
- .4 Splashpads: Preformed concrete slabs.
- .5 Gaskets: closed cell polyurethane foam, adhesive on two sides, release paper protected.
- .6 Touch-up paint: as recommended by panel manufacturer.
- .7 Isolation coating: epoxy resin solution. Isolate fascia from eavestrough.

2.3 Fabrication

- .1 Form gutters and downspouts to profiles and sizes indicated.
- .2 Field measure site conditions prior to fabricating work.
- .3 Fabricate with required connection pieces.
- .4 Form sections square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
- .5 Hem exposed edges of metal.
- .6 Seal metal joints.
- .7 Fabricate gutter and downspout accessories; seal watertight.

3 EXECUTION

3.1 Preparation

- .1 Protect metal surfaces in contact with aluminum with specified isolation coating.

3.2 Installation

- .1 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten fascia to building structure.
- .2 Join lengths with seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- .2 Apply bituminous protective backing on surfaces in contact with dissimilar materials.
- .3 Slope gutters 5mm/m minimum, to downspout areas indicated.
- .4 Seal metal joints watertight for full metal surface contact.

3.3 Cleaning

- .1 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.
- .2 Remove excess sealant with recommended solvent.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements

1.2 References

- .1 ASTM C 1193 Standard guide for use of joint sealants.
- .2 CGSB 19-GP-5M-76, Sealing Compound, One Component, Acrylic Base, Solvent Curing.
- .3 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
- .4 CGSB 19-GP-14M-76, Sealing Compound, One Component, Butyl-polyisobutylene Polymer Base, Solvent Curing.
- .5 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
- .6 CAN/CGSB-19.18-M87, Sealing Compound, One Component, Silicone Base, Solvent Curing.
- .7 CAN/CGSB-19.21-M87, Sealing and Bedding Compound Acoustical.
- .8 CAN/CGSB-19.22-M89, Mildew Resistant, Sealing Compound for Tubs and Tiles.
- .9 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

1.3 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.

1.4 Delivery, Storage, and Handling

- .1 Deliver, handle, store and protect materials in accordance with Section 01610 - Basic Product Requirements.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 Environmental and Safety Requirements

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 Ventilate area of work by use of approved portable supply and exhaust fans.

1.6 Quality Assurance

- .1 Installation of sealants shall be performed by a firm with minimum of five (5) years' experience.

1.7 Warranty

- .1 Submit written warranty against leaks, cohesive failure, staining of adjacent materials, in accordance with GC 12.3 but for five (5) years.
- .2 The warranty shall be issued by the Contractor and the Sealant Manufacturer.

2 PRODUCTS

2.1 Sealant Materials

- .1 Sealants and caulking compounds must:
 - .1 meet or exceed all applicable governmental and industrial safety and performance standards; and
 - .2 be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, and the Canadian Environmental Protection Act (CEPA).
 - .3 Use products of a single manufacturer for each different product and required recommended primers.
- .2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.
- .3 Sealant and caulking compounds must not contain a total of volatile organic compounds (VOCs) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product;
- .4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .5 Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant shall not be used in air handling units.
- .6 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .7 Sealants acceptable for use on this project except CAN/CGSB-19.1 and CAN/CGSB-19.18 must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

2.2 Sealant Material Designations

- .1 Polyurethane One Part.
 - .1 Self-Levelling and Non Sag to CAN/CGSB-19.13, Type 1 and 2,
 - .2 Acceptable material: Tremco: Dymonic
Sonneborn: NP1, SL1
Sikaflex 1A

- .2 Polyurethane Two Part.
 - .1 Self-Levelling and Non Sag to CAN/CGSB-19.24, Type 1 and 2
 - .2 Acceptable material: Tremco: Dymeric
Sonneborn: NP2
Sikaflex: 2C or 2CSL.

- .3 Acrylic Latex One Part.
 - .1 To CAN/CGSB-19.17.
 - .2 Acceptable material: Tremco: Tremflex 834
General Electric (G.E. Supply): Acryliasil AL1300 (RC520)
Sonneborn: Sonolac.

- .4 Silicone Sanitary Sealant
 - .1 To CAN/CGSB-19.22 one part mildew resistant paintable..
 - .2 Acceptable material: Tremco - Tremsil 200
General Electric (G.E. Supply): 1700
Dow Corning: 786.

- .5 Acoustical Sealant - Synthetic Rubber
 - .1 To CGSB 19.21
 - .2 Acceptable material: Tremco - Acoustical Sealant.

2.3 Preformed Compressible and Non-compressible Back Up Materials

- .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
 - .1 Extruded open closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.
- .2 Neoprene or Butyl Rubber.
 - .1 Round solid rod, Shore A hardness 70.
- .3 High Density Foam.
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
- .4 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.4 Joint Cleaner

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: as recommended by manufacturer.

3 EXECUTION

3.1 Protection

- .1 Protect installed work of other trades from staining or contamination.

3.2 Preparation of Joint Surfaces

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, 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 manufacturer's directions.

3.3 Priming

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 Backup Material

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 Mixing

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 Application

- .1 Sealant.
 - .1 Apply sealant in accordance with manufacturer's written 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 gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .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 Cleanup.
 - .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 initial set of sealant.

3.7 Sealant Schedule

- .1 Interior Sealants - Non Elastomeric (acrylic latex)
 - .1 Perimeter of built in architectural wood work
 - .2 Junction: of casework gables and flooring.
 - .3 Perimeter of pressed steel frames and adjacent finishes, including bottom at floor.
 - .4 Interior perimeter of exterior openings.
- .2 Interior Sealants Elastomeric: Polyurethane One Part
 - .1 Interior side of expansion and control joints of concrete, masonry and precast concrete walls.
 - .2 Interior control and expansion joints in floor and deck surfaces (self-levelling) sealant.
 - .3 Joints at underside of precast beams or slabs.
 - .4 Interior joints of precast concrete walls.
 - .5 Joints or tops of non load bearing masonry walls at underside of poured concrete.
 - .6 Exposed interior control joints in drywall.
 - .7 Interior perimeter of exterior openings
- .3 Interior Sealants - Silicone Sanitary
 - .1 Perimeter of bath fixtures (sinks, tubs, showers, urinals, water closets, basins, showers, vanities, stools)
 - .2 Junction of ceramic wall tile and finished flooring
- .4 Interior Sealants - Acoustical
 - .1 Joints at tops of drywall and underside of structure.
- .5 Exterior Sealants – Elastomeric: Polyurethane Two Part
 - .1 Perimeter of exterior openings where frames connect exterior facade of building (ie. brick, block, precast, masonry).
 - .2 Expansion and control joints in exterior surfaces of poured in place concrete, precast concrete, unit masonry, and architectural wall panels.
 - .3 Coping joints and coping to facade joints.
 - .4 Cornice and wash or horizontal surface joints.
 - .5 Exterior control expansion and joints in concrete decks and horizontal traffic surfaces (use self levelling sealants).
- .6 Self Levelling Sealants
 - .1 Sealant Control joints in concrete decks.
 - .2 Exterior joints in horizontal traffic surfaces.
 - .3 Exterior control and expansion joints in decks.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 07271 - Air Barriers
- .2 Section 07900 - Joint Sealers
- .3 Section 08110 - Steel Doors and Frames.
- .4 Section 08120 – Aluminum Doors & Frames
- .5 Section 08500 - Windows

1.2 REFERENCES

- .1 CAN/ULC - S705.1-98 Polyurethane foam spray thermal insulation.
- .2 LEED Reference Guide v4.0 (as published by the Canadian Green Building Council).

1.3 SUBMITTALS

- .1 Submit product data to requirements of Section 01330.
- .2 Product Data: Provide data on material characteristics, performance criteria, limitations.
- .3 Manufacturers installation instructions: Indicate preparation, installation requirements and techniques, product storage and handling criteria.
- .4 Include manufacturer=s material safety data sheets in accordance with WHMIS requirements.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature and humidity recommended by materials manufacturers before, during and after installation.

1.5 COORDINATION

- .1 Coordinate work of this section with all sections referencing this section.

2 PRODUCTS

2.1 INSULATING FOAM AIR SEAL MATERIALS

- .1 Insulating foam air seal materials: Single component spray in place polyurethane foam, final cured foam shall have a density of 35.2kg/m³ and a design thermal resistance of minimum 1.0 m² C/W per 25mm thickness.

- Acceptable Products:
 - .1 CANAM Building Products - ZERO DRAFT
 - .2 BASF: Walltite

3 EXECUTION

3.1 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept the work of this section.

3.1 PREPARATION

- .1 Remove loose or foreign matter that might impair adhesion of foam materials.

- .2 Clean and prime substrate surfaces to receive in accordance with manufacturer=s instructions. Ensure all surfaces to receive foam are free of all grease, oil, frost, loose scale, rust, water and other unsuitable material.
- .3 Cover surrounding surfaces with temporary masking to protect form over spray.

3.1 INSTALLATION

- .1 Install materials in accordance with manufacturer=s instructions.
- .2 Apply insulating foam air-seal material to produce a continuous air seal to bridge and seal openings and penetrations in building envelope.
- .3 Apply in sufficient thickness to provide continuity of thermal protection between adjacent installed assemblies and exposed components.
- .4 Apply materials within recommended application temperature ranges. Consult manufacturers when sealant cannot be applied within these temperature ranges.
- .5 Apply the foam in passes of between 15 and 50mm thickness.
- .6 Keep foam at least 75mm away from heat emitting devices such as recessed light fixtures and chimneys.
- .7 Do not cover electrical wiring by more than 20mm unless protective shielding is installed to prevent overheating.
- .8 Ensure that foam is not exposed in final assembly.

3.2 PROTECTION OF FINISHED WORK

- .1 Protect finished work under provisions of Division 01.
- .2 Do not permit adjacent work to damage work of this section.

3.5 CLEANING

- .1 Remove masking and other temporary protection from adjacent surfaces.
- .2 Clean and make good all damage caused by work of this section.

3.6 SCHEDULE

- .1 Install foamed-in-place insulating air seal at the following locations:
 - .1 in exterior door and window framed openings.
 - .2 at penetrations of building envelope.
 - .3 at gaps in building envelope.
 - .4 all other locations indicated.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 07900 - Joint Sealers
- .3 Section 08710 - Door Hardware
- .4 Section 08800 - Glazing
- .5 Division 16: Wiring for electronic hardware.

1.2 REFERENCES

- .1 ASTM A 653M-95, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
- .3 CAN/CSA-G40.21-M92, Structural Quality Steels.
- .4 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).
- .5 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990.
- .6 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .7 CAN4-S104M- M80 (R1985), Fire Tests of Door Assemblies.
- .8 CAN4-S105M-M85, Fire Door Frames.

1.3 DESIGN REQUIREMENTS

- .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35EC to 35EC.
- .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330.
- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed louvred, arrangement of hardware and fire rating and finishes.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing finishes.

- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.
- .6 Indicate all special conditions.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M NFPA 252 for ratings specified or indicated.
- .1 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104.

1.6 WARRANTY

- .1 Provide a written warranty for work of this section from manufacturer for failure due to defective materials and from contractor for failure due to defective installation workmanship, for two (2) years, respectively.

2 PRODUCTS

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts. (Paintable Galvanneal)
- .2 Reinforcement channel: to CAN/CSA-G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.

2.2 DOOR CORE MATERIALS

- .1 Honeycomb construction:
 - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.
 - .2 Stiffened: face sheets laminated welded, honeycomb uninsulated insulated core.
 - .1 Fibreglass: to CSA A101, semi-rigid Type 1A3 density 24 kg/m³.
 - .2 Expanded polystyrene: CAN/CGSB-51.20, density 16 to 32 kg/m³ fire retardant.
 - .3 Polyurethane: to CGSB 51-GP-21M rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m³.
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 30-60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E 152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMERS

- .1 Touch-up prime CAN/CGSB-1.181.

2.5 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top caps: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Door bottom seal.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal rivetted.
- .7 Sealant: to Section 07900.
- .8 Glazing: to Section 08800.
- .9 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
 - .2 Design exterior glazing stops to be tamper proof.

2.6 FRAMES FABRICATION GENERAL

- .1 Fabricate doors and frames in accordance with CSDFMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6mm thermally broken type construction.
- .4 Interior frames: 1.6 mm welded construction.

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- .5 Blank, reinforce, drill and tap frames for mortised, template hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
 - .6 Protect mortised cutouts with steel guard boxes.
 - .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
 - .8 Manufacturer's nameplates on frames and screens are not permitted.
 - .9 Conceal fastenings except where exposed fastenings are indicated.
 - .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
 - .11 Insulate exterior frame components with polyurethane insulation.

2.7 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

2.8 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .7 Securely attach lead to inside of frame profile from return to jamb soffit inclusive on door side of frame only at lead lined door assembly

2.9 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: honeycomb construction. Interior doors: honeycomb construction.

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- .3 Fabricate doors with longitudinal edges locked seamed, adhesive assisted welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
 - .4 Blank, reinforce, drill doors and tap for mortised, template hardware and electronic hardware.
 - .5 Factory-prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
 - .6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
 - .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
 - .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
 - .9 Manufacturer's nameplates on doors are not permitted.

2.10 DOORS: HONEYCOMB CORE CONSTRUCTION

- .1 Form each face sheet for exterior doors from 1.6 mm sheet steel with honeycomb polystyrene polyurethane core laminated under pressure to face sheets.
- .2 Form each face sheet for interior doors from 1.6 mm sheet steel with honeycomb - temperature rise rated core laminated under pressure to face sheets.

2.11 HOLLOW STEEL CONSTRUCTION

- .1 Form each face sheet for exterior doors from 1.6 mm sheet steel.
- .2 Form each face sheet for interior doors from 1.6 sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with fiberglass core.
- .5 Fill voids between stiffeners of interior doors with fiberglass core.

2.12 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

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- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
 - .4 Apply insulation to frame.

2.13 ACOUSTIC DOORS

- .1 Completely fill voids, sound deaden core.
- .2 Mechanically interlock longitudinal edges.
- .3 Provide all acoustic seals as required at doors.

3 EXECUTION

3.1 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDFMA Installation Guide.

3.2 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 opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air vapour barrier per section 07271.

3.3 DOOR AND FRAME HARDWARE PREPARATION

- .1 All doors and frames shall be prepared to receive typical hardware such as cylindrical locks, closers, exit devices and hinges. The number of hinges shall be suitable to the sizing of the doors. Suppliers shall also refer to the Door and Screen Schedule for notes on other specialized hardware requirements such as, but not limited to electronic requirements and concealed hardware. Suppliers shall coordinate hardware preparations with the hardware supplier upon selection as per Section 01013, Allowances.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08710 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latch side and head: 1.5 mm.
 - .3 Finished floor, top of carpet noncombustible sill and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08800 - Glazing.

END OF SECTION

1 GENERAL

1.1 RELATED WORK

- .1 Scope of Work includes;
 - .1 Supply of interior wood doors, closet door hardware
- .2 Related Work Specified elsewhere,
 - .1 Section 08710 Finished Hardware
 - .2 Installation and trims by Section 06200, Finish Carpentry.

1.2 SUBMITTALS

- .1 Submit shop drawings in accordance with Division 01.
- .2 Indicate door types sizes and cutouts for lights and louvres. Indicate ULC ratings, core material and finish.

1.3 WARRANTY

- .1 Provide Manufacturer's Warranty in the name of the Owner that interior solid core wood doors will not warp, twist, show core lines, split, delaminate or sag for a period of ten (10) years for doors up to 1220mm wide and 2743mm high.

2 PRODUCTS

2.1 WOOD DOORS

- .1 WD-1: Typical Wood Doors: 44.5mm (1-3/4") thick as follows:
 - .1 Face Construction:
 - .1 Masonite finish for doors scheduled to receive paint finish.
 - .2 Maple veneer, clear rift cut for doors scheduled to receive stain finish.
 - .2 Glazing: as specified in Section 08800.
 - .3 Core: minimum 28pcf particle chip core or hollow core where noted. See Door Schedule.
 - .4 Glazing stops: solid wood to match face for doors with no fire rating and doors with a 20 minute fire rating; provide metal stops for doors with fire ratings exceeding 20 minutes.
 - .5 Edges: finish to match face.
 - .6 Rails & Stiles: 38mm hardwood lumber, glued to core.
 - .7 Supply complete with fire resistance rating label as required. See Door Schedule.
 - .8 Acceptable manufacturers:
 - .1 Cambridge Doors
 - .2 Lambton Doors
 - .3 Weyerhaeuser
 - .4 Masonite
 - .5 Or approved equal.
- .2 WD-2: Wood Doors within non-rated suite interiors: 35mm (1-3/8") thick, residential grade as follows:
 - .1 Faces: prefinished molded door with textured raised panels for doors scheduled to receive paint finish unless otherwise noted.
 - .2 Glazing: as specified in Section 08800.
 - .3 Edges: finish to match face.

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- .4 Supplier prepared for door hardware.
 - .5 Acceptable Product: six-panel, textured, molded door by Masonite
 - .3 WD-3: Sliding and Bifold Closet Doors (within suite interiors):
 - .1 Faces: prefinished molded door with textured raised panels for doors scheduled to receive paint finish unless otherwise noted.
 - .2 Glazing: as specified in Section 08800.
 - .3 Edges: finish to match face.
 - .4 Acceptable Product: six-panel, textured, molded door by Masonite
 - .5 Size sliding doors to overlap 50-75mm.
 - .6 Hardware
 - .1 Bifold Door Hinges: supplier to include with door
 - .2 Sliding Door Hardware: Model C-2025 by KN Crowder, anodized aluminum finish, in lengths as required. Use C-1202 guides with C-1206 guidestrip. Use C-100 door stops for each doors.
 - .3 Door Handles to match Architectural Woodwork Section 06400.
 - .4 Finish: as per Door Schedule and Section 09900.

2.2 DELIVERY, STORAGE AND HANDLING

- .1 Remove wrappings and coverings to doors upon delivery to site, check for damage. Store doors in a vertical position, spaced with blocking to allow for air circulation.

3 EXECUTION

3.1 DOOR PREPARATION FOR HARDWARE

- .1 All doors and frames shall be prepared to receive typical hardware such as cylindrical locks, closers, exit devices and hinges. The number of hinges shall be suitable to the sizing of the doors. Suppliers shall also refer to the Door and Screen Schedule for notes on other specialized hardware requirements such as, but not limited to electronic requirements and concealed hardware. Suppliers shall coordinate hardware preparations with the hardware supplier upon selection as per Section 01013, Allowances.

3.2 INSTALLATION

- .1 Install doors and hardware in accordance with manufacturer's printed instructions.
- .2 Adjust hardware for correct function.
- .3 Install louvres and stops.
- .4 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 09250 - Gypsum Board

1.2 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330
- .2 Indicate material finishes, connections, anchors and details.

2 PRODUCTS

2.1 Access Panels

- .1 Panel Types
 - .1 Access Panels
 - .2 Universal: Flush
 - .3 Recessed: for drywall acoustic tile or other insert materials.
 - .4 High Security: for fire rated walls and ceilings.
- .2 Material
 - .1 Door: Fabricate from 14 gauge cold rolled steel sheet
 - .2 Frame: Fabricate from 16 gauge cold rolled steel with perimeter frame. Provide mounting holes and masonry anchors where necessary.
 - .3 Hinges: Concealed pin type spring load to allow for door removal. Provide continuous piano hinge with stainless steel pin on sizes larger than 7500 mm.
 - .4 Latching: Provide mortise cylinder locks for security applications. Elsewhere use screw driver cam locks.
 - .5 Finish: Phosphate dipped with baked on rust inhibitive prime paint finish.
 - .6 Acceptable Manufacturers: Nystrom Inc – Mifab or approved equal.

2.2 Access Doors

- .1 Provide access doors for work of other divisions at locations where equipment requiring inspection, service, maintenance or adjustment is "built-in" to work of other trades.
- .2 Access as indicated and at;
 - .1 expansion joints,
 - .2 dampers,
 - .3 fire dampers,
 - .4 air valves,
 - .5 air terminal units,
 - .6 valves,
 - .7 pressure reducing valves and,
 - .8 open drains within pipe space.
- .3 Submit shop drawings showing access door size, type and location.
- .4 Access doors:

- .1 constructed of steel, prime coated,
- .2 flush mounted with 180° opening door, round safety corners, concealed hinges,
- .3 plaster lock and anchor straps,
- .4 600 mm x 600 mm for personnel entry,
- .5 300 mm x 450 mm for hand entry, and
- .6 constructed of stainless steel in areas finished with tile or marble surfaces
- .7 fitted with screwdriver operated latches, or similarly keyed cylinder locks in
- .8 secure areas.
- .9 Standard of Acceptance includes the following or approved equals.
 - .1 Baird - ABCO
 - .2 Stelpro - Type 700
 - .3 Williams Brothers - GP
 - .4 LeHage
 - .5 Acudor
 - .6 Mifab

- .5 Fire Rated Access Doors (for drywall walls applications):
 - .1 Fire rated to maintain continuity in a 2 hour fire rated wall,
 - .2 Concealed hinge, Self-closing, Self-Latching, Inside latch release
 - .3 Material: 16 gauge Steel
 - .4 Mounting Frame: Flush to frame with reinforced edges, drywall taping bead flange.
 - .5 Fire Rating (Walls): UL — 1-1/2 hour "B" label.
 - .6 Max size 36 x 48. Confirm sizes on Drawings.
 - .7 Standard Latch: Universal self-latching bolt, operated by either a knurled knob or flush key. Prepare door for cylinder locks and coordinate keying with Owner.
 - .8 Approved Product: FB-5060-DW by Acudor or approved equal.

- .6 Installation
 - .1 Supply access doors and make arrangements and pay for installation by Division in whose work they occur.
 - .2 Size and locate access doors in applied tile, block or in glazed or unglazed structural tile to suit joint patterns.
 - .3 Access doors in ceilings, where acoustic tile is applied to plaster or gypsum board, to be dish type designed to receive tile insert.

- .7 Access doors are not required in removable ceilings. Provide coloured marking devices after completion of ceilings, at four corners of each panel below point requiring access. Colour code markers to show service or device above.

- .8 At time of instruction of owners operating staff, hand-over and obtain signed receipt for 4 sets of each type of key used to lock access doors in secure areas.

- .9 Finish: painted to match adjacent surfaces.

3 EXECUTION

3.1 Installation

- .1 Install as per manufacturer's recommendations to locations and types indicated.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 07900 Joint Sealers - Caulking of joints between frames and other building components
- .2 Section 07100 Air and Vapour Barriers - Joining of air, vapour and waterproof membranes to window frames

1.2 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-79.1-M91, Insect Screens.
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A440-M90, Windows.
 - .2 CAN/CSA-Z91-M90, Safety Code for Window Cleaning Operations.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Indicate materials and details in scale full size for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

1.4 Test Reports

- .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .3 Windows classifications A3, B7, C5, D2.
 - .4 Weathering characteristics.
 - .5 Insect screens.
 - .6 Air tightness.
 - .7 Water tightness.
 - .8 Wind load resistance.
 - .9 Condensation resistance.
 - .10 Block operation - sliding windows only.
 - .11 Sash strength and stiffness - Operable Casement Projecting.
 - .12 Ease of operation - windows with operable lights.
 - .13 Sash pull-off - vinyl windows.
 - .14 Forced entry resistance.
 - .15 Mullion deflection - combination and composite windows.

1.5 Maintenance Data

- .1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01780 - Closeout Submittals.

2 PRODUCTS

2.1 Materials

- .1 Materials: to CAN/CSA-A440 supplemented as follows:
- .2 Manufacturer - Seymour Windows and Doors, Northwood Windows, or approved equal.
- .3 Sash: vinyl thermally broken.
- .4 Main frame: vinyl thermally broken.
- .5 Glass: insulated double glazed sealed units, E-film, Argon gas filled.
- .6 Screens: to CAN/CGSB-79.1.
 - .1 Insect screening mesh: count 18 x 14, 18 x 16.
 - .2 Fasteners: tamper proof.
 - .3 Screen frames: aluminum, colour to match window frames.
 - .4 Mount screen frames for interior replacement.
- .7 Casing Trims and Returns:
 - .1 Interior Sills, Jamb Returns and Header Returns: 5/8" solid PVC trimboard by Royal Building Products, or approved equal; smooth finish; colour: white.
 - .2 Interior Casing Trims: prefabricated and 'snap-together' interior PVC casings with rosettes at corners; colour: white.

2.2 Window Type and Classification

- .1 Types:
 - .1 Casements and Awnings: crank out units with collapsible handle, locks, seals.
 - .2 Sliders: sliding single operating unit with insulating glass units.
 - .3 Fixed: with insulating glass.
 - .4 Insect Screens: removable for cleaning; on all ventilating portion of windows.
- .2 Classification rating: to CAN/CSA-A440:
 - .1 Air tightness: A3.
 - .2 Water tightness: B7.
 - .3 Wind load resistance: C5.
 - .4 Condensation resistance: Temperature Index, I D2.
 - .5 Forced Entry: F1.
 - .6 Insect Screens: S1.
 - .7 Glazing: G1.
- .3 Safety: Install fixed restrictors to restrict operable opening to maximum 100mm for all windows 3m above grade.

2.3 Fabrication

- .1 Fabricate in accordance with CAN/CSA-A440 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.

2.4 Vinyl Finishes

- .1 Vinyl finishes:
 - .1 Exterior Colour: custom painted colour. Up to 2 colours.
 - .2 Interior Colour: White;
 - .3 Finish to be in accordance with CAN/CSA-A440, including appendices, supplemented.

2.5 Glazing

- .1 Glaze windows in accordance with CAN/CSA-A440.

2.6 Hardware

- .1 Hardware: prefinished metal sash locks and handles to provide security and permit easy operation of units.
- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.
- .3 Install window opening restrictors to prevent opening windows more than 100mm (4") as indicated. Incorporate tamper-proof and secure fasteners to prevent occupant tampering. Restrictor hardware is to be concealed within the window frame.

2.7 Air Barrier and Vapour Retarder

- .1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
 - .1 Material: identical to, or compatible with, building air barrier and materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

3 EXECUTION

3.1 Window Installation

- .1 Install in accordance with CAN/CSA-A440.
- .2 Arrange components to prevent abrupt variation in colour.

3.2 Occupant Safety during Installation

- .1 Removals and installations must be performed in prompt sequence. At no time shall a non-worker be present when the window opening is unsafe for falling hazards.

3.3 Caulking

- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07900 - Joint Sealers. Conceal sealant within window units except where exposed use is permitted by Consultant.

END OF SECTION

1 GENERAL

1.1 WORK INCLUDED

- .1 Supply finish Door Finish Hardware. Installation by 06200 under Base Bid.
- .2 It is intended that the following list of hardware will cover all finish hardware to complete the project. Omissions and discrepancies shall be brought to the architect's attention during the bidding period.

1.2 RELATED SECTIONS

- .1 01021 Allowances
- .2 01610 Basic Product Requirements
- .3 06200 Finish Carpentry
- .4 08110 Metal Door & Frames
- .5 08120 Aluminum Doors and Frames
- .6 Division 16: Electrical wiring for magnetic locks, electric strikes, electric locks, electric releases and power supplies.

1.3 PRODUCTS SUPPLIED BUT NOT INSTALLED IN THIS SECTION

- .1 Power supplies, compressor/control boxes, junction boxes, magnetic locks, electric locks, electric strikes, door status switches and electric releases installed by Division 16.

1.4 REQUIREMENTS REGULATORY AGENCIES

- .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Provide permanently attached labels for all hardware required to be rated as part of a fire-resistant door and frame assembly.

1.5 REFERENCES

- .1 Recommended locations for Architectural Hardware for Standard Steel Doors and Frames - Door and Hardware Institute
- .2 Recommended locations for Architectural Hardware for Flush Wood Doors – Door and Hardware Institute
- .3 NFPA 80-Standard for Fire Doors and Windows
- .4 Sequence Format for Hardware Schedule – Door and Hardware Institute
- .5 Key Systems and Nomenclature - Door and Hardware Institute

- .6 Abbreviations and Symbols used in Architectural Door and Hardware Schedules and Specifications – Door and Hardware Institute.
- .7 Ontario Building Code 2012 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

1.6 WARRANTY

- .1 Provide a written manufacturer's warranty for work of this Section for failure due to defective materials for ten (10) years, dated from substantial completion.
- .2 Provide a written Contractor's warranty for work of this Section for failure due to defective installation workmanship for one (1) year, dated from submittal substantial completion.

2 PRODUCTS

2.1 MATERIALS

- .1 Where a hardware allowance is provided within Section 01021, Allowances, a hardware schedule will be offered to the Contractor after Tender.
- .2 Intentionally left blank.
- .3 Installation and preparation cost associated with the hardware must be included in the tender bid.
- .4 All work associated with section 06400 Architectural Woodwork shall be excluded from this section and shall be included in the base bid.
- .5 The following base products will be deemed an acceptable standard for the supply of Hardware.
 - .1 Lever & locksets: Cylindrical latches and levers;
 - 1. Coordinate locking and actions as indicated;
 - 2. Acceptable product: AL Series by Schlage, with Saturn lever design, or approved equal.
 - .2 Rim Exit Devices:
 - 1. 33A & 35A Rim exit device by Von Duprin or approved equal.
 - 2. Electric latch retraction as required.
 - 3. Matching outside trim where indicated, to suit lever device above.
 - .3 Architectural Hinges: 5-Knuckle, Ball Bearing Full Mortise Hinge,
 - 1. Model 5BB1 by Ives or approved equal.
 - 2. Electrified hinges to match.
 - .4 Continuous Hinges:
 - 1. Roton Concealed Leaf, Heavy Duty, manufactured by Hager, or approved equal
 - .5 Thresholds: Extruded Aluminum Thresholds
 - 1. (125mm) 5" width, (12.7mm) 1/2" height;
 - 2. thermally broken where indicated,
 - 3. by KN Crowder or approved equal.

- .6 Weatherstripping, door sweeps, door brushes by KN Crowder, or approved equal.
- .7 Self-closing devices (Closers);
 - 1. coordinate mounting, arm lengths and configurations to suit site conditions;
 - 2. 1460 Series by LCN, or approved equal.
- .8 Power Door Operators:
- .9 Electric strikes: 5200 Series by Hes - Assa Abloy, or approved equal.
- .10 Door Push/Pulls:
 - 1. Offset Door Pull (15" Depth) with
 - 2. Push Bar CBH 7040 to suit door width.
 - 3. By CBH or approved equal.
- .11 Removable Mullions: steel or aluminum mullion to match door frame material
 - 1. VON 1654 (steel) or 5654 (aluminum) mullion, or approved equal.
 - 2. Where electrified door controls are required, use VON 4954 (steel) or 5754 (aluminum) mullion, or approved equal.
 - 3. Finishes to match door frames.
- .12 Surface Mounted Overhead Stops: 90 Series by Glynn-Johnson or approved equal.
- .13 Door activation controls, switches, and universal washroom hardware components by Camden Door Controls, or approved equal. Power supplies as needed for door controls.
- .6 Finishes: All products to match door finish unless otherwise indicated.
 - .1 Finishes for HM and Wood doors: satin chrome or as otherwise indicated.
 - .2 Finishes for Aluminum Doors: finish to match door.
- .7 Keying
 - .1 Doors, padlocks and cabinet locks to be keyed as noted in Hardware Schedule as directed. Submit keying schedule for approval.
 - .2 Provide keys in duplicate for every lock in this Contract.
 - .3 Provide three master keys for each MK or GMK group.
 - .4 Stamp keying code numbers on keys and cylinders.
 - .5 Owner requires Contractor to coordinate keying with the Best Access System.

3 EXECUTION

3.1 EXAMINATION

- .1 Ensure that doors and frames are properly prepared and reinforced to receive finish hardware

prior to installation.

- .2 Ensure that door frames and finished floor are sufficiently plumb and level to permit proper engagement and operation of hardware.
- .3 Submit in writing a list of deficiencies determined as part of inspection required in 3.1.1 and 3.12 to supervising consultant prior to installation of finished hardware.

3.2 INSTALLATION

- .1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval. All installers to attend review meetings with the hardware distributor.
- .2 Install hardware at mounting heights as specified in the manufacturer's templates or specific references in approved hardware schedule or approved elevation drawings.
- .3 Where mounting height is not otherwise specified, install hardware at mounting heights as indicated in above referenced standards.
- .4 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.
- .5 Ensure that all locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. **Handing is part of installation procedure.**
- .6 Ensure that all exit devices are of the correct hand and adjust device cam for proper outside trim function prior to installation. **Handing is part of installation procedure.**
- .7 Follow all manufactures installation instructions. Adjustment is inclusive of spring power, closing speed, latching speed and back-check at the time of installation.
- .8 Install head seal prior to installation of "PA"-parallel arm mounted door closers and push side mounted door stops/holders.
- .9 Counter sink through bolt of door pull under push plate during installation.
- .10 Mount all closers, automatic operators and hold-open devices with through bolts, as indicated in the finish hardware schedule.

3.3 FIELD QUALITY CONTROL

- .1 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.
- .2 Before completion of the work but after the hardware has been installed, a certificate to the architect will be submitted stating that final inspection has been made and that hardware has been checked for installation and operation by a technician from the manufacturer and hardware consultant.

3.4 ADJUSTING AND CLEANING

- .1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.
- .2 All hardware to be left clean and free of disfigurements.
- .3 Instruct/demonstrate to Consultant and Owner's staff in the proper operation, adjustment, maintenance of hardware and finishes.
- .4 Check all locked doors against approved keying schedule.
- .5 Remove protective coatings prior to final inspection.
- .6 Prior to date of substantial completion, adjust hardware. Repair or replace defective hardware or installation.

3.5 PROTECTION

- .1 Protect hardware from damage during construction period by removing and reinstalling or where necessary, using temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.6 HARDWARE GROUPS

- .1 As indicated. Schedules to be provided by Hardware Supplier by Allowance where indicated.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Conform to Sections of Division 1 as applicable.

1.2 RELATED WORK

- .1 Section 08110 Steel Doors and Frames
.2 Section 08210 Wood Doors

1.3 REFERENCES

- ASTM C509-91 - Specification for Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C542-90 - Specification for Lock-Strip Gaskets
ASTM D1044-90 - Test Method for Resistance of Transparent Plastics to Surface Abrasion
ASTM D1925-70 - Test Method for Yellowness Index of Plastics
ASTM E90-90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions
CAN/CGSB-12.1 - M90 -Tempered or Laminated Safety Glass
CAN2-12.3-M76 - Glass, Polished Plate or Float, Flat, Clear
CAN2-12.4-M76 - Glass, Heat Absorbing
CAN/CGSB-12.5-M86 -Mirrors, Silvered
CAN2-12.6-M76 - Mirrors Transparent (One-Way)
CAN/CGSB-12.8-M90 - Insulating Glass Units
CAN2-12.9-M76 - Glass, Spandrel
CAN2-12.10-M76 - Glass, Light and Heat Reflecting
CAN/CGSB-12.11-M90 -Wired Safety Glass
CAN/CGSB-12.12-M90 -Plastic Safety Glazing
CAN2-12.13-M79 - Glass, Patterned
CAN/CGSB-19.2-M87 -Glazing Compound Non-hardening Modified Oil Type
CAN/CGSB-19.13-M87 -Sealing Compound, One-Component, Elastomeric, Chemical Curing
CAN/CGSB-19.18-M87 -Sealing Compound, One-Component, Silicone Base, Solvent Curing
CAN/CGSB-19.21-M87 -Sealing and Bedding Compound Acoustical
CAN/CGSB-19.24-M90 -Multicomponent, Chemical-Curing Sealing Compound
Glazing Manual 90 - Flat Glass Marketing Association

1.4 SUBMITTALS

- .1 Samples: Submit samples of materials if required by Consultant before commencing work. Ensure samples are clearly labelled with manufacturer's name and type.

2 PRODUCTS

2.1 GLASS MATERIALS

- .1 Float Glass: CAN2-12.3-M; 6mm thick shall conform to the latest Ontario Building Code unless otherwise noted.
.2 Tempered Safety Glass: CAN/CGSB 12.1-M, "Herculite" clear tempered safety glass by PPG Canada Inc. Thickness 6mm unless otherwise indicated.

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- .3 Wired Glass (GWG, Fire Rated): For interior doors and screens shall be clear, 6 mm (1/4") thick with 13 mm (1/2") mesh of at least .4 mm (.016") diameter centrally embedded in glass during manufacture and welded or intertwined at each intersection.
- .4 Safety Glass (Fire Rated):
1. Acceptable product and Manufacturer:
 - .1 FireLite NT as manufactured by Nippon Electric Glass Company, Ltd.
 - .2 Approved alternative product will be considered by the consultant prior to tender close only.
 - .2 Performance Requirements
 1. Fire-rated glass ceramic clear and wireless glazing material with surface-applied film listed for use in impact safety-rated locations such as doors, transoms and borrowed lites with fire rating requirements ranging from 20 minutes to 3 hours with required hose stream test.
 - .2 Passes positive pressure test standards UL 10C.
 - .3 Material Standards:
 1. Thickness: 5 mm
 2. Film: Fire-rated surface film as approved by manufacturer.
 3. Weight: 2.4 lbs./sq. ft.
 4. Approximate Visible Transmission: 88 percent.
 5. Approximate Visible Reflection: 9 percent.
 6. Hardness (Vicker's Scale): 700.
 7. Fire-rating: 20 minutes to 3 hours for doors; 20 minutes to 90 minutes for other applications. See door and frame schedule.
 8. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
 9. Positive Pressure Test: UL 10C; passes.
 10. Surface Finish: Premium Grade is finish ground and polished on both surfaces to provide superior surface quality, improving overall clarity and providing a surface that is unmatched by alternative products.
 4. Fire Rating: Fire rating classified and labelled by ULC for fire rating scheduled at opening locations on drawings, when tested in accordance with ULC Standards CAN4 S-104 and CAN4 S-106 NPFA 252 and NFPA 257. Permanently label each piece of glazing with the manufacturer's logo, ULC logo and fire rating.
- .5 Insulating Glass Units:
- .1 CAN/CGSB-12.8-M patented sealed double-glazed units by PPG Industries Ltd., AFG Glass Inc., or Canada Glass Industries.
 - .2 PPG Solarban coatings have been identified however equivalent solar coatings by AFG or Canada Glass Industries will be accepted.
 - .3 Insulated Glass Unit Description:
 - .1 Glass to CAN/CGSB-12.1, float glass per schedule
 - .2 Outer Panel: 6mm thick tempered glass
 - .3 Air Space: to be 13mm hermetically sealed argon gas filled.
 - .4 Inner Pane: 6mm thick tempered glass. Apply Solarban 60 (3) to inner pane as indicated.
 - .5 Overall system thickness: 25 mm, or to suit manufacturers detail.

- .6 Spandrel Glass: to CAN/CGSB-12-10, 6 mm thick
- .7 Mirror: Custom mirrors to sizes indicated in drawings. Silver mirror to CAN/CGSB-12-5, 3mm thick, adhered to wall surface and pencil edged.
- .8 Decorative Glazing films: Self-adhesive, non-patterned frosted glazing film with integrated artwork as indicated. Acceptable product: 3M Fasara or approved equal.

2.2 GLAZING AND SEALING COMPOUND MATERIALS AND ACCESSORIES

- .1 Sealant Compound: CAN/CGSB-19.24-M, multi-component chemical curing, Type 2 Class A. Colour to match adjacent surfaces.
- .2 Glazing Tape: 440 polyisobutylene-butyl tape manufactured by Tremco Manufacturing Co. Canada Ltd., or 3M ribbon sealer butyl tape manufactured by Minnesota Mining and Manufacturing Co. Ltd.
- .3 Gaskets: ASTM C509 cellular, elastomeric, preformed, black.
- .4 Glazing Splines: Polyvinylchloride manufacturer's standard dry glazing splines to suit aluminum extrusions. Colour to match adjacent surfaces unless indicated otherwise.
- .5 Spacer Shims and Setting Blocks: Neoprene, Shore "A" Durometer hardness 70-90, 100 mm long, wide enough to extend from fixed stop to opposite face of glass and of height suitable to provide adequate glazing "bite" for setting blocks. Neoprene, Shore "A" 40 to 50 Durometer hardness, of adequate thickness to provide correct glass to face clearance of at least 3 mm for spacer shims.
- .6 Primer Sealers and Cleaners: To glass and plastic glazing manufacturer's standards.
- .7 Breather Tubes: To manufacturer's recommendations.

2.3 FABRICATION

- .1 Label each light of glass and/or plastic glazing with registered name of product and weight and quality of glass and/or plastic glazing.
- .2 Check dimensions on Job Site before cutting materials.
- .3 Ensure minimum bite or lap of glass and/or plastic glazing on stops and rabbets as recommended by glass and/or plastic glazing manufacturer.

3 EXECUTION

3.1 INSTALLATION

- .1 Glazing - General
 - .1 Conform to recommendation of Glazing Manual 1990, Flat Glass Marketing Association,

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- except as specified herein.
 - .2 Glaze hollow metal doors, screens, borrowed lights, windows and other work, scheduled to be glazed.
 - .3 Check frames are plumb, within tolerance for size and joints, connectors, screws or bolt heads are effectively sealed.
 - .4 Check compatibility of glazing materials and framing sealants with each other.
 - .5 Do not field cut or abrade tempered glass.
 - .6 Install glazing within temperature limits recommended by glazing manufacturer.
 - .7 Check to ensure openings and stops to be painted have been primed before commencing installation.

3.2 WORKMANSHIP

- .1 Ensure openings are free from moisture, frost, rust, dirt and foreign matter.
- .2 Remove protective coatings. Clean glass surface to receive sealant with clean cloth dampened with Xylol or 50-50 mixture of Acetone and Xylol. Wipe dry with clean, dry cloth.
- .3 Clean plastic glazing with cleaning agents and follow procedures recommended by glazing manufacturer.
- .4 Apply primer-sealer to contact surfaces.
- .5 Place setting block in accordance with manufacturer's instructions.
- .6 Install glass by resting on setting blocks. Ensure full contact and adhesion at perimeter. Do not impact glass against framing during installation.
- .7 Install removable stops without displacing tape, sealant or gasket.
- .8 Provide edge clearance of 3 mm minimum.
- .9 Apply cap bead of sealant at exterior void. Apply sealant to uniform and level line, flush with sightline and tool or wipe with solvent to smooth appearance.
- .10 Apply tape to clean dry surface not more than 24 hrs prior to glazing. Do not remove release paper until glass is ready to be installed. Joints shall be squared and tightly and neatly butted. Do not overlap. Do not stretch tape to make it fit. Lightly daubed joints with compatible gunnable sealant to assure positive seal. Only joints in tape shall be at corners.
- .11 Lateral shims if not continuous shall be spaced uniformly at 450 mm to 600 mm centres.
- .12 Interior Glazing
 - .1 Fire Rated Hollow Metal Doors and Screens:
 - Set glass in fire rated metals doors and screens on continuous setting block with 3 mm gap between glazing stop glass and embed in glazing compound in accordance with NFPA 80 and OBC requirements. Strike and point exposed joints between metal and glass or install glass in accordance to ULC tested proprietary methods of installation.
 - 2. Dry Method-Tape/Tape:
 - Cut glazing tape to proper length and install against permanent stop projecting 1.5 mm above sightline.

- Place glazing tape on free perimeter of glass projecting 1.5 mm above sightline.
- Trim off excess tape to sightline.

3. Combination Method-Tape/Sealant:

- Cut glazing tape to proper length and install against permanent stop projecting 1.5 mm above sightline.
- Fill gap between glass and applied stop with sealant to depth equal to bite of frame on glass to uniform and level line.
- Trim off excess tape to sightline.
- Fill gaps between glass and stops with compound until flush with sightline and tool to smooth straight line.

.13 Exterior Glazing

1. Dry Method Lock Strip and Compression Gaskets:

- Unpack and layout gaskets on flat warm area to permit recovery of shape.
- Install gaskets under compression from corners inward.
- Place setting blocks in accordance with manufacturer's instructions.
- Provide continuous interior air seal between glass and sash.
- Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendation for size and placement.
- Apply sealant cap bead over exterior gasket to provide watershed.

2. Combination Method-Tape/Gasket:

- Cut glazing tape to proper length and set against permanent stops, approximately 0.8 mm (1/32") below sightline. Install horizontal strips first, extend over entire width of opening before applying vertical strips. Weld corners together by butting tape and dabbing with sealant.
- Remove backing paper from tape prior to setting glass.
- Apply continuous heel bead between glass and sash.
- Place setting blocks 2 on each sill member at quarter points.
- Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendations for size and placement.
- Take care not to plug up vent holes in sill with sealant.
- Centre on setting blocks and press firmly against tape.

3. Combination Method-Tape/Sealant:

- Cut glazing tape to proper length and set against permanent stops approximately 0.8 mm (1/32") below sightline. Install horizontal strips first, extend over entire width of opening before applying vertical strips. Weld corners together by butting tape and dabbing with sealant.
- Remove backing paper from tape prior to setting glass.
- Apply continuous heel bead between glass and sash.
- Place setting blocks 2 on each sill member at quarter points.
- Drain infiltrated moisture to exterior through drain holes in sill. Provide minimum 3 vents for each sill separated by setting blocks. Follow manufacturer's recommendations for size and placement.
- Take care not to plug up vent hole in sill with sealant.
- Centre on setting blocks and press firmly against tape.
- Place intermittent shims or spacers at 600 mm o.c. between exterior stop and glass or panel where glass exceeds 2540 mm (100 united inches).

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- Apply continuous space shim with rubber set elastomeric sealant cap bead over top between interior light and removable stop.

3.3 FINISHING

- .1 Remove sealant and compound droppings from finished surface.
- .2 Periodically clean installed glass during construction to avoid permanent etching and staining.
- .3 Mark glass lights with temporary, easily removable large safety markings after glass installation. Maintain safety markings until final cleanup. Remove markings at time of final clean-up.
- .4 Avoid storing materials adjacent to glass.
- .5 Protect glass from other trades.
- .6 At completion of Work, replace any damaged or broken glass provided under this Section with similar glass.

3.4 GLAZING SCHEDULE

- .1 Co-ordinate glazing schedule with door and frame schedule and elevations/windows schedule.
- .2 All interior glazing shall be tempered safety glass unless noted otherwise.
- .3 All interior fire rated screens & doors shall use clear fire rated safety glass unless noted otherwise. Refer to Door and Frame schedule and Fire Rated Glass specification for conditions of interior glass in fire separations.
- .4 All glazing at exterior entrance doors are to be tempered both sides of insulated glass units.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 07213 - Loose, Batt and Blanket Insulation
- .3 Section 08110 - Steel Doors & Frames
- .4 Section 09250 - Gypsum Board

1.2 REFERENCES

- .1 ASTM C 645-99, Standard Specification for Nonstructural Steel Framing Members.
- .2 ASTM C 754-98a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .3 CAN/CGSB 7.1 Cold Formed Steel Framing Components
- .4 CAN/CGSB-19.21-M87, Sealing and Bedding Compound Acoustical.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330.
- .2 Indicate details, materials, bracing and connections to structure.

2 PRODUCTS

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C 645, to stud size indicated, roll formed from 0.91mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C 645, in widths to suit stud sizes, 32 mm flange height.
- .3 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .4 Acoustical sealant: to CAN/CGSB-19.21.
- .5 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.
- .6 Sheet Metal Backing: 20-gauge galvanized steel sheet for support for wall hung items such as hand rails, wall guards, TV and Monitor brackets, cabinets, washroom accessories.

3 EXECUTION

3.1 ERECTION

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- .1 Align partition tracks at floor and ceiling and secure at 400 mm o.c. maximum.
 - .2 Install continuous sill gasket under stud shoe tracks of partitions on slabs on grade.
 - .3 Place studs vertically at 400mm oc and not more than 50 mm 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.
 - .4 Erect metal studding to tolerance of 1:1000.
 - .5 Attach studs to bottom ceiling track using screws.
 - .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
 - .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
 - .8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
 - .9 Install heavy gauge single jamb studs at openings.
 - .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
 - .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
 - .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars, towel rails, and building signage, attached to steel stud partitions.
 - .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
 - .14 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.
 - .15 Install continuous insulating strips to isolate studs from uninsulated surfaces.
 - .16 Install two continuous beads of acoustical sealant at head and sill of studs and tracks each side, around perimeter of sound control partitions. See partition schedule.
 - .17 Extend partitions to underside of structure except where noted otherwise. Use telescoping or slotted hole track to accommodate deflection. Fill with loose Batt insulation in sound control partitions

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- .18 Fill voids between top runner and structure or other voids and penetrations through fire rated partitions with mineral fibre firestopping and/or fire stopping sealant in accordance to Section 07270.
 - .19 Do not extend partition framing across building expansion joints. Erect two studs 25mm apart in at joint.
 - .20 Provide additional studs, furring channels or steel 20 gauge backer sheets for attachment and support of: Work of other trades
 - .21 Remove fireproofing from structure necessary to install and secure framing to structure. Patch and make good fire rating to ULC Design.
 - .22 Where partitions occur parallel to trough of steel deck above install furring channels at 200mm o.c. spanning one or more troughs each side of partition.
 - .23 Where studs extend over 3.6m in height, provide horizontal bracing at 2.4m o.c. vertically.
 - .24 Design as per Ontario Building Code requirements, all structural members for openings less than 2400mm at all locations, (including but not limited to doors, screens, windows, openings, etc.).
 - .25 Provide framing for suspended window head supports regardless of size.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 09110 - Non-Load Bearing Wall Framing
- .3 Section 09900 - Painting

1.2 REFERENCES

- .1 ASTM C 36-95, Specification for Gypsum Wallboard.
- .2 ASTM C 475-94, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C 630-93, Specification for Water-Resistant Gypsum Backing Board.
- .4 ASTM C 840-95, Specification for Application and Finishing of Gypsum Board.
- .5 ASTM C 954-93, Specification for Steel Drill Screws for the Application of Gypsum Board.
- .6 ASTM C 1002-93, Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- .7 ASTM C 1047-94, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .8 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .9 CAN/ULC-S102-1988, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of.

1.3 SITE ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.

2 PRODUCTS

2.1 MATERIALS

- .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30 galvanized.
- .2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

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- .3 Resilient clips drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
 - .4 Nails: to ASTM C 514.
 - .5 Steel drill screws: to ASTM C 1002.
 - .6 Laminating compound: as recommended by manufacturer, asbestos-free.
 - .7 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, metal, zinc-coated by hot-dip process, zinc coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
 - .8 Sealants: in accordance with Section 07900 - Joint Sealers.
 - .9 Acoustic sealant: Tremco Acoustical Sealant.
 - .10 Polyethylene: to CAN/CGSB-51.34, Type 2.
 - .11 Acoustic Insulation Batts: Mineral wool batts minimum density 48 kg/m³ size to fit stud spacing to thickness indicated.
 - .1 Acceptable Materials: AFB by Roxul
 - .12 Acoustic Blanket Anchors: Hot dipped galvanized steel strips pre-punched for screw fasteners and arrows for blanket impalement, minimum 2 arrows per stud height, depth of arrow to suit wall and insulation thickness.
 - .13 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
 - .14 Joint compound: to ASTM C 475, asbestos-free.
 - .15 Joint Tape to ASTM C475. Use fiberglass at areas of reinforced corner board in washrooms, showers, lockers and humid areas. Elsewhere use paper tape.
 - .16 Glass Mat Gypsum Panel: use sheet panels at wet areas / humid areas.
 - .1 Acceptable Material: 13mm DensArmour Plus Interior Guard or approved alternate.
 - .17 Standard Board: to ASTM C36, Type X to E119, 16mm thick, 1220mm wide x maximum practical length, ends square cut, edges tapered.
 - .18 Abuse resistant gypsum panels: to CAN/ULC-S102-M88 16mm thick Type 'X' 1,200 mm wide x practical length, ends square cut, edges squared. Fiberrock VHI by C.G.C. or approved equal. To locations as noted on drawings
 - .19 Exterior Sheathing Board: Glass mat water-resistant gypsum backing board: to ASTM C 1177, 13mm thick, 1,200 mm wide x maximum practical length.
 - .1 As DensGlass Gold Exterior Guard or approved equal.

3 EXECUTION

3.1 ERECTION

- .1 Do work in accordance with ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Install work level to tolerance of 1:1200.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150mm of each corner and at maximum 600mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, ceiling devices.
- .7 Install 19 mm x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, fitments, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring where indicated transversely across studs between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw
- .14 Install 150 mm continuous strip of 16 mm gypsum board along base of partitions where resilient furring installed.

3.2 APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, and other penetrations, in partitions where perimeter sealed with acoustic sealant.

3.3 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and 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 150 mm oc using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Splice corners and intersections together and secure to each member with 3 screws.
- .6 Install access doors to electrical and mechanical fixtures specified in respective Sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .7 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.
- .8 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .9 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .10 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .11 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .12 Install sand and finish bulkheads completely as indicated in drawings. Both face and soffit of bulkhead prior to installation of casework.

3.4 ACOUSTICAL INSULATION

- .1 Install insulation in partitions and other locations indicated. Secure using strip clips, staple or impale clips.
- .2 Maintain continuity of acoustical protection.
- .3 Fit insulation closely around electrical boxes, pipes, ducts, frames and objects in or passing through insulation.
- .4 Do not compress insulation to fit.
- .5 Keep insulation 75mm away from heat emitting devices such as recessed lights.

.6 Do not cover insulation until reviewed by Consultant.

3.5 SCHEDULES

.1 Construct fire rated assemblies where indicated.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 07900 - Joint Sealers
- .3 Section 09652 - Resilient Sheet Flooring

1.2 References

- .1 Do all work in accordance with Installation Manual 2000, produced by Terrazzo Tile and Marble Assoc., (TTMAC)
- .2 ANSI A118.4 1992 Specifications for Latex Portland Cement Grout
- .3 ANSI A118.6 1992 Specifications for Ceramic Tile Grout
- .4 ANSI A118.1- 1992, Specifications for Dry-Set Portland Cement Mortar.
- .5 CAN/CGSB-51.34- M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .6 CAN/CGSB-75.1- M88 Tile, Ceramic.
- .7 CAN/CSA-A5/A8/A362- 93, Portland Cement/Masonry Cement/Blended Hydraulic Cement.

1.3 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit duplicate 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

1.4 Extra Material

- .1 Provide maintenance materials in accordance with Section 01780 - Closeout Submittals.
- .2 Provide extra tiles required for project for maintenance use. Store where directed.
- .3 Maintenance material to be of same production run as installed material.

1.5 Environmental Conditions

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 h before, during, and 48 h after, installation.

2 PRODUCTS

2.1 Floor Tile

-
- .1 Porcelain Floor Tile (CT-1): Size 610 x 610 x 9.5-10mm, Natural Finish, slip resistant tile, complete with trim nosings, coves and accessories necessary to complete work.
 - .1 Acceptable Products:
 - .1 Centura - Uniquestone
 - .2 Ceratec Surfaces – Realstone Slate
 - .3 or approved equal.
 - .2 Colours: (1) Colour as later selected by consultant from full colour range.
 - .3 Matching ceramic tile base 100mm high as indicated. Align wall base tiling pattern to floor tiling where adjacent.

2.2 Wall Tile

- .1 Kitchen Backsplash Wall Tile, Finish: Matte, complete with trim nosings, coves and accessories necessary to complete work.
 - .1 Acceptable Products:
 - .1 Olympia – Colour & Dimension Series or approved equal
 - .2 Size: 4"x4" (CT-2), 2"x8" (CT-3), 8"x20" (CT-4), 4"x16" (CT-5)
Refer to interior elevations for locations
 - .3 Colours: Up to (2) colours as later selected by consultant from full colour range.
 - .2 Washroom Walls, Ceramic tile complete with trim nosings, coves and accessories necessary to complete work.
 - .1 Acceptable Products:
 - .3 Supplier: Centura, Manufacturer: Sartoria, Collection: Vibes
 - .4 Finish: Matte
 - .5 Size: 2"x10", 2x25cm, Thickness: 8.5mm
 - .6 Texture: Flat (CT-3) and Fold (CT-4). Refer to interior elevations for locations.
 - .5 Colours: Four colours (1 per washroom) as later selected by consultant from full colour range.

2.3 Mortar and Adhesive Materials

- .1 Portland cement: to CAN3-A5, type 10.
- .2 Bond Coat Materials: Latex - Portland cement mortar to AHSI A118.4
 - .1 A two component liquid latex mixed with factory blended dry set mortar.
 - .2 Acceptable Material:
 - 1. Mapei: Keralastic System
 - 2. Laticrete: Laticrete 3701
 - 3. approved equal.
 - .3 Adhesive Material
 - .1 Organic adhesive: to CGSB 71-GP-22M , Type 1 .
 - .2 Acceptable Material (Walls):
 - 1. Mapei: Type 1 (Ker 903),
 - 2. Flextile 90,
 - 3. Laticrete: Laticrete 15, or

- 4. approved equal.
- .3 Acceptable Material (Floors):
 - 1. Mapei: Karabond, or
 - 2. approved equal.

2.4 Grout

- .1 Portland Cement Grout: to ANSI A118.6
 - .1 A two component liquid latex mixed with pre-packaged dry grout mix.
 - .2 Acceptable Material (Walls):
 - 1. Mapei: Ker 200
 - 2. Latcrete: 600 Series
 - 3. Flextile: Polymer Modified wall grout
 - 4. or approved equal.
 - .3 Acceptable Material (Floors):
 - 1. Mapei: Ker 800
 - 2. Laticrete: 500 series
 - 3. Flextile: Polymar Modified floor grout
 - 4. or approved equal.

2.5 Accessories

- .1 Tile Transition Trims:
 - .1 Acceptable Manufacturers: Schluter Systems or approved equal.
 - .2 Edge Trims for Wall Base and Wall Tiles: Schluter JOLLY transition strip to protect exposed edges of tile.
 - .3 Corner Trims for Wall Tiles: Schluter QUADDEC corner trims to protect exposed edges of tiles at outside corners.
 - .3 Flooring Transition Strips: Schluter SCHIENE transition strip at flooring transitions.
 - .4 Finishes: clear anodized aluminum
- .2 Floor Sealer and Protective Coating to tile and grout manufacturer's recommendations.
- .3 Sealant: in accordance with Section 07900 - Joint Sealers.
- .4 Divider Strips: 8mm zinc alloy.
- .5 Provide stainless steel floor finish cap strips to transition between resilient floor cove base and ceramic wall tile where floor cove base is indicated.

2.6 Mortar and Adhesive Mixes

- .1 Scratch coat: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand.
- .2 Slurry bond coat: portland cement and acrylic. Latex by Laticrete.
- .3 Mortar bed for floors: 1 part sanded portland cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.
- .4 Mortar bed for walls and ceilings: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job

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- conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included
- .6 Levelling coat: 1 part portland cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.
 - .7 Bond or setting coat: 1 part portland cement, 1/3 part hydrated lime, 1 part water.
 - .8 Measure mortar ingredients by volume.
 - .9 Dry set mortar: mix to manufacturer's instructions.
 - .10 Organic adhesive: pre-mixed.

3 EXECUTION

3.1 Workmanship

- .1 Do tile work in accordance with Installation Manual 200, "Ceramic Tile", produced by Terrazzo Tile and Marble Association of Canada (TTMAC), except where specified otherwise.
- .2 Apply tile to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .8 Make internal angles square, external angles rounded bullnosed .
- .9 Install divider strips at junction of tile flooring and dissimilar materials.
- .10 Allow minimum 24 h after installation of tiles, before grouting.
- .11 Clean installed tile surfaces after installation and grouting cured.
- .12 Make control joints where indicated. Make joint width same as tile joints. Fill control joints with sealant in accordance with Section 07900 - Joint Sealers- Keep building expansion joints free of mortar and grout.

3.2 Floor Sealer and Protective Coating

- .1 Apply in accordance with manufacturer's instructions.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements
- .2 Section 09710 - Acoustical Wall Treatment
- .3 Section 09130 - Acoustical Suspension
- .4 Section 16500 - Lighting

1.2 References

- .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 CAN/ULC-S102-M88, Surface Burning Characteristics of Building Materials.

1.3 Samples

- .1 Submit samples in accordance with Section 01330.
- .2 Submit duplicate full-size samples of each type acoustical units.

1.4 Environmental Requirements

- .1 Permit wet work to dry before commencement of installation.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20-40% before and during installation.

1.5 Extra Materials

- .1 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.
- .2 Extra materials to be from same production run as installed materials.
- .3 Clearly identify each type of acoustic unit, including colour and texture.
- .4 Store where directed by Consultant.

2 PRODUCTS

2.1 Materials

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.
 - .1 General.
 - .2 Flame spread rating of 25 or less.
 - .3 Smoke developed 50 or less.
 - .4 Noise reduction coefficient (NRC) designation of 55 or better
 - .5 Light reflectance range of over 75
- .2 Types:
 - .1 ACT-1:
 - .1 Panels: tegular edge, white
 - .2 Sizes: as indicated, 610 x 1220 x 15mm or 610 x 610 x 15mm
 - .3 Tile product: non directional fissured, mineral fibre composition.

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- .4 Fire rated for a ULC listing, where a fire rating is indicated.
 - .5 Acceptable products: "Dune" by Armstrong Interiors or "Sand Micro" by CertainTeed, or approved equal.
- .3 Suspension System
 - .1 Hangers: minimum 2.8 mm overall thickness, zinc coated to Z265.
 - .2 Grid: Main and Cross Tees and Edge Moulding: Double webbed, hot dipped galvanized cold rolled steel construction, prefinished white cap
 - .3 Fire rated for a ULC listing, where a fire rating is indicated.
 - .4 Acceptable products: Prelude Plus XL FireGuard, 15/16" by Armstrong Ceilings, or approved equal.
 - .4 Trim Accessories:
 - .1 Straight extruded aluminum channel trim for perimeter treatments of suspended ceilings.
 - .2 Profile: 150mm Straight
 - .3 Colour: White
 - .4 TR-1, Acceptable products:
 - .1 Armstrong: Axiom Classic
 - .2 CertainTeed: Cloud Perimeter Trim
 - .3 or approved equal

3 EXECUTION

3.1 Examination

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

3.2 Installation

- .1 Install panels and tiles in ceiling suspension system to manufacturer's instructions.
- .2 Install fibrous acoustical media and spacers over entire area above suspended metal panels.
- .3 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.3 Application

- .1 Install acoustic units to clean, dry and firm substrate.
- .2 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width with directional pattern running in same direction to reflected ceiling plan.
- .3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.4 Interface with Other Work

- .1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

3.5 Schedules

- .1 See Drawings, as indicated.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01610 - Basic Product Requirements

1.2 References

- .1 ASTM F 1303, Specifications and ASTM 1913 for Sheet Vinyl Floor Covering
- .2 CAN/CSA A 126.5 Resilient Wall Base.

1.3 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base, nosing, feature strips, treads, edge strips.

1.4 Closeout Submittals

- .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01780 - Closeout Submittals.

1.5 Extra Materials

- .1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01780 - Closeout Submittals.
- .2 Provide 20m² of each colour, pattern and type flooring material required for project for maintenance use.
- .3 Extra materials to be in one piece and from same production run as installed materials.
- .4 Clearly identify each roll of sheet flooring and each container of adhesive.
- .5 Deliver and store where directed by Consultant.

1.6 Environmental Requirements

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees C for 48 hours before, during and 48 hours after installation.

2 PRODUCTS

2.1 Materials

- .1 LVT, Luxury Vinyl Plank Flooring: to applicable CSA and ASTM standards sheet vinyl flooring and product design.
 - .1 Tarkett, iD Inspiration 70
 - .2 Mannington, Spacia Xpress Wood
 - .3 Gerflor, Creation 70
 - .4 Polyflor, Expona Commercial PUR
- .2 up to (2) colour as later selected by Consultant from manufacturer's full colour range.
- .2 SSHV, Safety Sheet Vinyl Flooring: to applicable CSA and ASTM standards sheet vinyl flooring and product design and up to (2) colours as later selected by Consultant.

- .1 Sheet Vinyl Homogeneous: unbacked flexible homogeneous single layered 2.0mm thick
- .2 to CSA A126.6 and ASTM F1913 66% vinyl content composed of polymer plus plasticizer plus stabilizer
- .3 product to be dry buffed for the life of the product.
- .4 product to be chip visual made up of two (2) colours
- .5 floor design patterns as indicated.
- .6 Acceptable Products:
 - .1 Polysafe Wood FX PUR
 - .3 or approved equal
- .5 Feature strips: of same material and thickness as adjacent work 50mm wide, in colour selected by Consultant.
- .6 Rubber Base (RB): covered vulcanized rubber base, 102 mm high x 3.0 mm thick in manufacturer's standard colour range as later selected by consultant to a minimum of three (3) colours for project. Manufactured by American Biltrite (Amtics), Johsonite, Finercraft, or approved equal.
- .7 Flash cove: continuous flash cove base of matching flooring colour, complete with cove former and cap strip of matching colour material, 100mm high or as indicated.
- .8 Primers and adhesives: waterproof, of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .9 Sub-floor filler and leveler: white premix latex requiring water only to produce cementitious paste as recommended by flooring manufacturer for use with their product
- .9 Metal edge strips: Aluminum extruded, smooth, mill finish stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .10 External corner protectors: type recommended by flooring manufacturer.
- .11 Edging to floor penetrations: type recommended by flooring manufacturer.
- .12 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

3 EXECUTION

3.1 Site Verification of Conditions

- .1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 Preparation

- .1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .3 Prime and or Seal concrete slab to flooring manufacturer's printed instructions.

3.3 Application: Flooring

- .1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to the outside. Do not let contaminated air re-circulate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.
- .3 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .4 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .5 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's printed instructions.
- .6 Heat weld seams of sheet flooring in accordance with manufacturer's printed instructions.
- .7 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .8 Cut flooring neatly around fixed objects.
- .9 Install feature strips and floor markings where indicated. Fit joints tightly.
- .10 Install flooring in pan type floor access covers. Maintain floor pattern.
- .11 Continue flooring over areas which will be under built-in furniture.
- .12 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .13 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .14 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.4 Application: Stairs

- .1 Install stair nosings / stair treads / stair risers one piece for full width of stair. Adhere over entire surface and fit accurately.

3.5 Application: Base

- .1 Install flash cove base at Resilient Seamless floor where indicated.
- .2 Lay out base to keep number of joints at minimum.
- .3 Clean substrate and prime with one coat of adhesive.
- .4 Apply adhesive to back of base.
- .5 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .6 Install straight and level to variation of 1:1000.
- .7 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .8 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.
- .9 Use toeless type base where floor finish will be carpet, coved type elsewhere.
- .10 Install toeless type base before installation of carpet on floors.
- .11 Heat weld base in accordance with manufacturer's printed instructions.

3.6 Cleaning

- .1 Remove excess adhesive from floor, base and wall surfaces without damage.
- .2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.7 Protection

- .1 Protect new floors from time of final set of adhesives until final waxing.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Use only water-based coating for linoleum.

3.8 Schedules

- .1 Provide the following seam layout and pattern unless otherwise indicated to Consultants colour selection.
 - .1 Rooms: Provide maximum width rolls centred in one direction with borders
 - .2 Welding: to later colour selection
 - .3 Provide patterning as per floor pattern diagram.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01330 Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements
- .3 Section 06200 - Finish Carpentry

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM D 3960- 93, Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.36- 97, General Purpose Interior Varnish.
 - .2 CAN/CGSB-1.38- M91, Interior Enamel Undercoater.
 - .3 CAN/CGSB-1.57- 96, Alkyd, Interior, Semigloss, Enamel.
 - .4 CAN/CGSB-1.60- 97, Interior Alkyd Gloss Enamel.
 - .5 CAN/CGSB-1.100- 95, Interior Latex Type, Flat Paint.
 - .6 CAN/CGSB-1.119- 95, Primer-Sealer, Wall, Interior Latex Type.
 - .7 CAN/CGSB-1.121- 93, Vinyl Pretreatment Coating for Metals (Vinyl Wash Primer).
 - .8 CAN/CGSB-1.145- 97, Solvent-Based Pigmented Stain.
 - .9 CAN/CGSB-1.150- M91, Clear Lacquer for Wood Furniture.
 - .10 CAN/CGSB-1.175- 97, Polyurethane Interior Coating, Oil Modified, Clear, Gloss and Satin.
 - .11 CAN/CGSB-1.188- 96, Emulsion Type Filler Masonry Block.
 - .12 CAN/CGSB-1.195- 95, Interior Semigloss Latex Paint.
 - .13 CAN/CGSB-1.198- 95 , Cementitious Primer (for Galvanized Surfaces).
 - .14 CAN/CGSB-1.209- 93, Low Sheen Latex Interior Paint.
 - .15 CGSB 85-GP-16M- 79, Painting Galvanized Steel.
 - .16 CGSB 85-GP-20M- 79, Painting copper and Copper Alloys.
 - .17 CGSB 85-GP-33M- 79, Painting Interior Plaster and Wallboard.
 - .18 CAN/CGSB-85.100- 93, Painting.
- .3 Painting Specifications Manual 1993.
- .4 National Fire Code of Canada 1995.
- .5 Steel Structures Painting Council (SSPC).
 - .1 Systems and Specifications Manual 1989.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01330 - Submittal Procedures.
- .2 Submit full records of all products used. 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 Material Safety Data Sheets (MSDS).
 - .7 Maximum VOC classification.
 - .8 Eco-Logo certification.
- .3 Submit manufacturer's installation application instructions for each product specified.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Submit duplicate 300 mm x 200 mm sample panels of each paint stain coating specified.
- .3 Submit full range of available colours where colour availability is restricted.
- .4 Use 3 mm plate steel for finishes over metal surfaces. Use 12.5 mm birch plywood for finishes over wood surfaces. Use 12.5 mm concrete board for finishes over concrete or concrete masonry surfaces. Use 12.5 mm gypsum board for finishes over gypsum board and other smooth surfaces.

1.5 QUALITY ASSURANCE

- .1 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: No defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.6 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 Provide and maintain dry, temperature controlled, secure storage.
- .5 Observe manufacturer's recommendations for storage and handling.
- .6 Store materials and supplies away from heat generating devices.
- .7 Store materials and equipment in a well ventilated area with temperature range 7 to 30 EC.
- .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
- .10 Provide minimum one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .11 Remove only in quantities required for same day use.
- .12 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 National Fire Code of Canada.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Environmental Choice Program (ECP)
 - .1 Provide paint products certified to meet the requirements of the Environmental Choice Program, Department of the Environment.

- .2 Submit CSA Certification Reports that products proposed for use are certified under the Environmental Choice Program. Water based paints to be certified to ECP-07. All other surface coatings to be certified to ECP-12.
- .2 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .3 Ventilate enclosed spaces during all painting activities.
- .4 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
- .5 Substrate and ambient temperature must be within limits prescribed in paint standard and by manufacturer to approval of Engineer.
- .6 Maintain minimum substrate and ambient air temperature of 5 degrees C for Alkyd and 7 degrees C for latex paints. Maximum relative humidity 85%. Maintain supplemental heating until paint has cured sufficiently.
- .6 Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.
- .7 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.
- .8 Apply paint only when surface to be painted is dry, properly cured, adequately prepared and cleaned.
- .9 Provide minimum 270 lx on surfaces to be painted.

1.8 EXTRA MATERIALS

- .1 Submit maintenance materials in accordance with Section 01780 - Closeout Submittals.
- .2 Submit one - one four litre can of each type and colour of primer finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.
- .3 Deliver to Owner and store where directed.

2 PRODUCTS

2.1 MATERIALS

- .1 Qualified products: only paint materials listed on the CGSB Qualified Products List are acceptable for use on this project.
- .2 Qualified products: only paint materials listed to meet the requirements of the environmental choice program, Department of the Environment are acceptable for use on this project.
- .3 Paint materials for each coating formula to be products of a single manufacturer.
- .4 Low odour products: Whenever possible, select products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour.

2.2 COLOURS

- .1 Consultant will provide Colour Schedule. Notify Consultant 10 working days before colour schedule required.
- .2 Colour schedule will be based upon the selection of eight base colours and three accent colours. No more than three colours will be selected per room / or walls and ceilings.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .5 Perform all colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials allowed only with Consultant's permission.

- .6 Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

3 EXECUTION

3.1 GENERAL

- .1 Perform all painting operations in accordance with CAN/CGSB-85.100 except where specified otherwise.
- .2 Apply all paint materials in accordance with paint manufacturer's written application instructions.
- .3 Paint all wall surfaces in each room as per finish schedules. Wall surfaces/types may vary in each room. Paint all surfaces as required to meet painting specification for surface type to produce homogenous product.
- .4 General Contractor to finish paint all flush mounted electrical panels to match the adjoining wall colour.

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.

3.3 PROTECTION

- .1 Protect existing building surfaces not to be painted from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products, fixtures, finishes and equipment.

3.4 EXISTING CONDITIONS

- .1 Investigate existing 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. 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 Remove all dust, dirt, and other surface debris.
- .2 Wash surfaces with solution of T.S.P. bleach 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 To prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

- .5 Clean new metal surfaces to be painted by removing rust, loose mill scale, dirt, grease, oil, or other foreign substances.

3.6 SURFACE PREPARATION

- .1 Prepare new wood surfaces to CGSB 85-GP-1M.
- .2 Where possible, prime all surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
- .3 Prepare previously painted wood surfaces to CGSB 85-GP-2M.
 - .1 Apply vinyl sealer to CAN/CGSB-1.126 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .4 Prepare stucco, brick, concrete masonry and concrete surfaces to CGSB 85-GP-31M.
- .5 Prepare concrete floors to CGSB 85-GP-32M. Prepare new concrete floor by acid etching. Rinse with clean water and thoroughly dry.
- .6 Prepare plaster and wallboard surfaces to CGSB 85-GP-33M.

3.7 SURFACE PREPARATION – METAL

- .1 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.
- .2 Prepare galvanized steel and zinc coated steel surfaces to CGSB 85-GP-16M.
- .3 Prepare copper and copper alloys surfaces to CGSB 85-GP-20M.
- .4 Prepare new steel surfaces exposed normally to dry conditions to CGSB 85-GP-14M.
- .5 Prepare previously painted steel surfaces exposed normally to dry conditions to CGSB 85-GP-15M.
- .6 Do not apply paint until prepared surfaces have been accepted by Consultant.

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 and provide copy of instructions to Engineer.
- .3 Do not use kerosene or any such organic solvents to thin water-based paints.

3.9 APPLICATION

- .1 Apply paint to CAN/CGSB-85.100. Conform to manufacturer's application instructions unless specified otherwise.
- .2 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.
- .3 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .4 Sand and dust between each coat to remove visible defects.
- .5 Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.
- .6 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .7 Finish closets and alcoves as specified for adjoining rooms.
- .8 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.10 MECHANICAL ELECTRICAL EQUIPMENT

- .1 In finished areas: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment. Colour and texture to match adjacent surfaces, except as noted otherwise.
- .2 In boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 In other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .9 Paint all fire protection piping red.
- .10 Paint all natural gas piping yellow.
- .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.

3.11 RESTORATION

- .1 Clean and re-install all hardware items 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 to approval of Engineer. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

4 PAINT SCHEDULE

4.1 PAINT SCHEDULE INTERIOR PAINTING

- .1 Formula 1 (Latex): eggshell for gypsum board, plaster, hardboard walls, existing wall surfaces
 - .1 one coat latex primer sealer CAN/CGSB - 1.119
 - .2 two coats eggshell enamel CAN/CGSB - 1.195
2. Formula 2 (Latex): flat for gypsum board, plaster, hardboard ceilings.
 - .1 one coat latex primer sealer CAN/CGSB - 1.119
 - .2 two coats flat enamel CAN/CGSB - 1.209
3. Formula 3 (Latex): Flat for acoustic tile and textured ceilings:
 - .1 two coats latex flat CAN/CGSB-1.100
4. Formula 4 (Latex): Eggshell for concrete block and concrete walls:
 - .1 one coat block filler CAN/CGSB-1.188.
 - .2 one coat primer-sealer CAN/CGSB-1.119.
 - .3 two coats eggshell enamel CAN/CGSB-1.195.

- .5 Formula 5 (Latex): Semi Gloss for hollow metal doors and frames:
 - .1 primer-sealer touch up
 - .2 two coats latex semigloss CAN/CGSB-1.195.
- .6 Formula 6 (Alkyd): Semi Gloss for primed ferrous metal:
 - .1 two coats semigloss enamel CAN/CGSB-1.57.
- .7 Formula 7 (Alkyd): semi gloss for galvanized and zinc coated metal:
 - .1 one coat cementitious primer CAN/CGSB-1.198.
 - .2 two coats semigloss enamel CAN/CGSB-1.57.
- .8 Formula 8 (Latex): flat for galvanized metal deck:
 - .1 one coat cementitious primer CAN/CGSB-1.198.
 - .2 two coats flat paint CAN/CGSB-1.100.
- .9 Formula 9 (Alkyd): for insulation covering :
 - .1 one coat latex primer-sealer CAN/CGSB-1.119.
 - .2 two coats low gloss enamel CAN/CGSB-1.57.
- .10 Formula 10 (Alkyd): for copper piping and fittings:
 - .1 one coat vinyl wash primer CAN/CGSB-1.121.
 - .2 two coats low gloss enamel CAN/CGSB-1.202.
- .11 Formula 11 (Polyurethane): for woodwork to receive stain finish :
 - .1 one coat wood filler.
 - .2 one coat solvent based stain CAN/CGSB-1.145. Type 2.
 - .3 one coat polyurethane CAN/CGSB-1.175 thinned.
 - .4 two coats polyurethane CAN/CGSB-1.175 Type 2.
- .12 Formula 12 (Polyurethane): for wood floors:
 - .1 one coat wood filler.
 - .2 one coat solvent based stain CAN/CGSB-1.145.
 - .3 three coats, two-component polyurethane CGSB1-GP-180Ma.
- .13 Formula 13 (Latex): Interior painted wood work.
 - .1 one coat primer sealer.
 - .2 two coats paint.
- .14 Formula 14 (Stain and Varnish finish): (Stain for Decking) glulam columns and beams.
 - .1 Provide Sansin SDF, one coat enviro stain - standard - or equal, colour to later selection
- .15 Formula 15 (Alkyd): Semi Gloss for concrete block at shower walls and ceilings
 - .1 two coats semigloss enamel CAN/CGSB-1.57.

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01610 - Basic Product Requirements
- .2 Section 07410 – Preformed Aluminum Panels
- .3 Section 07900 - Joint Sealers.
- .4 Division 15: Ductwork.

1.2 REFERENCES

- .1 Aluminum Association
 - .1 Designation System for Aluminum Finishes - 1997.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 167-94, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A 366M-91(R1993), Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - .3 ASTM A 653/A653 M-90, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM B 32-95, Specification for Solder Metal.
 - .5 ASTM B 370-92, Specification for Copper Sheet and Strip for Building Construction.
 - .6 ASTM D 523-89(1993), Test Method for Specular Gloss.
 - .7 ASTM D 822-89, Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- .3 Canadian General Standards Board (CGSB)
 - .1 CGSB 1-GP-121M-93, Vinyl, Pretreatment Coating for Metals (Vinyl Wash Primer).
- .4 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01330. Provide colour samples for consultants later selection.
- .2 Indicate fabrication and erection details, including anchorage, accessories, and finishes.

1.4 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for manual or motorized operated louvres for incorporation into manual specified in Section 01780 - Closeout Submittals.

2 PRODUCTS

2.1 MATERIALS

- .1 Galvanized steel sheet: commercial quality to ASTM A 526M with Z275 zinc coating.
- .2 Steel sheet: commercial quality to ASTM A 366 with Class I matte finish.

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- .3 Aluminum sheet: mill finish plain utility sheet.
 - .4 Aluminium extrusions : Aluminium Association alloy AA6063-T5.
 - .5 Solder: to ASTM B 32, 50% tin and 50% lead.
 - .6 Flux: suitable for materials to be soldered.
 - .7 Nails and fasteners: same material as fabricated items.
 - .8 Gaskets: vinyl.
 - .9 Primer: to CGSB 1-GP-121M for copper aluminum surfaces.
 - .10 Prefinished steel with factory applied polyvinyl chloride.
 - .1 Class F1S F2S.
 - .2 Colour selected by Consultant from manufacturer's standard range.
 - .3 Specular gloss: 30 units +/-5 in accordance with ASTM D 523.
 - .4 Coating thickness: not less than 200 micrometres.
 - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows.
 - .1 Outdoor exposure period 5000 hours.
 - .2 Humidity resistance exposure period 5000 hours.
 - .11 Prefinished aluminum sheet.
 - .1 Finish aluminum sheet metal with factory applied coating to CAN/CGSB-93.1
 - .12 Formed sheet metal louvres.
 - .1 Fabricate sheet metal louvres from blades mullions and frame to sizes and shapes indicated.
 - .2 Provide concealed vertical stiffeners spaced to meet required loads.
 - .3 Complete louvre assembly to have 50% free area.
 - .4 Apply one coat of shop primer.
 - .5 Attach bird insect screen to inside face of louvre.
 - .13 Extruded aluminum louvres.
 - .1 Construct louvres from aluminum extrusions of minimum 3 mm thickness to sizes and shapes indicated.
 - .2 Arrange blades, mullions and frame extrusions as indicated.
 - .3 Install concealed vertical stiffeners spaced to meet required loads.
 - .4 Complete louvre assembly to have 50% free area.
 - .14 Blank Off Panels
 - .1 Provide insulated blank off panels where required to close louvres around attached ductwork. Finish exterior of panel to match louvre.
 - .15 Acceptable Products:
 - .1 CS Model RS-4605 Storm Resistant Louvre or approved equal.
 - .2 Finish: custom anodized finish to match Section 07410, Preformed Aluminum Cladding.
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- .16 Screens
 - .1 Birdscreens: crimped galvanized steel wire cloth secured to 2 2.2 mm thick extruded aluminum frame mitered at corners and secured with corner locks, 13 mm oc mesh, 1.3mm wire cloth.

 - .17 Explosion Vents where indicated.
 - .1 Acceptable Products: C/S products insulated aluminum panel ERP-1C
 - .2 Arrange blades, mullions and frame extrusions as indicated.
 - .3 Install concealed vertical stiffeners spaced to meet required loads.

2.2 FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.
- .3 Colour: finish to match surrounding surface cladding. Up to (2) colours.

3 EXECUTION

3.1 INSTALLATION

- .1 Install louvres and vents where indicated.
- .2 Attach bird screen to inside face of louvre or vent.
- .3 Repair damage to louvres and vents to match original finish.

END OF SECTION

1 GENERAL

1.1 Related Sections

- .1 Section 01330 - Submittal Procedures.
- .2 Section 01610 - Basic Product Requirements
- .3 Section 06200 - Finish Carpentry
- .4 Section 07900 - Sealants
- .5 Section 08800 - Glazing for custom mirrors
- .6 Division 16 - Electrical Hand Dryers

1.2 References

- .1 CAN/CGSB-12.5-M86, Mirrors, Silvered.
- .2 CAN/CSA-B651-95, Barrier-Free Design.
- .3 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01330 - Submittal Procedures.
- .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.

1.4 Samples

- .1 Submit samples in accordance with Section 01330 - Submittal Procedures.
- .2 Samples to be returned for inclusion into work.

1.5 Closeout Submittals

- .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01780 - Closeout Submittals.

1.6 Extra Materials

- .1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01780 - Closeout Submittals.
- .2 Deliver special tools to Owner.

1.7 Warranty

- .1 Submit warranty against defects in accordance with GC 12.3 but for (5) five years.

2 PRODUCTS

2.1 Materials

- .1 Sheet steel: to ASTM A653/A653M with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A167, Type 304, with No. 4 finish.

- .3 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.
- .5 Solid Acrylic: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials and colouring agents.
- .6 Manufacturer's or brand names on face of units is not acceptable.

2.2 Acceptable Products and Manufacturer's

- .1 Equivalent products from Frost Products Ltd., Bobrick Washroom Equipment of Canada Ltd., Watrous Inc. and Dunleavy Cordun Associates Inc. are acceptable.
- .2 Provide products for the work of this section from a single manufacturer and keyed alike.

2.3 Components

- .1 Toilet tissue holder: single roll, surface mounted, stainless steel, satin finish
 - .1 Acceptable material: ASI Group Canada, product #7314, dimensions: 5 3/16" x 3 3/8" x 2 3/16" (131 x 86 x 56mm)
- .2 Towel ring, stainless steel, satin finish
 - .1 Acceptable Material: ASI Group Canada, product #7306, dimensions: 7" dia. (178mm) extends 2 1/2" (64mm) from wall
- .3 Towel shelf with hanger rod, surface mounted, stainless steel, satin finish
 - .1 Acceptable Material: ASI Group Canada, product #7383, dimensions: 23 5/8" x 3 1/2" x 8 15/16" (600 x 89 x 227mm)
- .4 Robe hook: wall surface mounted, stainless steel, satin finish
 - .1 Single - Acceptable material: ASI Group Canada, product #7308, dimensions: extends 2 5/16" (59mm) from wall or door
 - .2 Double - Acceptable material: ASI Group Canada, product #7312, dimensions: extends 2 3/8" (60mm) from wall or door
- .3 Grab bars: 1.2 mm thick 30 mm diameter tubing of stainless steel, 80 mm diameter wall flanges; concealed screw attachment; Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2 kN.
 - .1 Acceptable material: Bobrick Model Series 5806 to profiles indicated.
- .4 Fold down Grab bars: Wall-Mounted Swing Up Grab Bar; 1-1/4" (32mm) diameter tubing; Satin-Finish, slip-resistant surface stainless steel grab bar for bath/shower/toilet compartment. Exposed mounting.
 - .1 Acceptable product: Bobrick Model B-4998
- .6 Fixed Mirror: Stainless steel one piece tamper proof with 6mm thick mirror tempered glass (10 year warranty). Install 1000mm above finished floor.
 - .1 Acceptable material: Bobrick Model B-1658. Size 24"x36" unless otherwise indicated.
- .7 Mirrors with Shelf: Stainless steel one piece tamper proof with 6mm thick mirror tempered glass (10 year warranty).
 - .1 Acceptable material: Bobrick Model B-1668 series to sizes indicated. Size 24"x36" unless

otherwise indicated.

- .8 Liquid Soap Dispenser: Type 304 stainless steel with satin finish
 - .1 Acceptable material: Bobrick Model, Contura Series B-4112
- .9 Baby Change Station: Fold down, Wall mounted, Horizontal
 - .1 Acceptable product: Bobrick Model B-2210
- .10 Shower Seat: Fold down, Wall mounted, 13mm Solid Phenolic surface, Stainless Steel Brackets and supports, ADA compliant
 - .1 Acceptable product: Bobrick Model B-5181

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.
 - .1 Brake form sheet metal work with 1.5 mm radius bends.
 - .2 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
 - .3 Back paint components where contact is made with building finishes to prevent electrolysis.
 - .4 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.
 - .5 Shop assemble components and package complete with anchors and fittings.
 - .6 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.
 - .7 Provide steel anchor plates and components for installation on studding and building framing.

2.5 Finishes

- .1 Chrome and nickel plating: to ASTM B456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.
- .3 Manufacturer's or brand names on face of units not acceptable.

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 provided by bar manufacturer.

- .3 Use tamper proof screws/bolts for fasteners.
- .4 Fill units with necessary supplies shortly before final acceptance of building.
- .5 Install mirrors in accordance with Section 08800 - Glazing.

3.2 Schedule of Washroom Accessories

- .1 Typical Suite Washrooms
 - .1 Toilet tissue holder – 1
 - .2 Grab Bars - none
 - .3 Robe Hook – 1-2 as indicated on interior elevations
 - .4 Fixed Mirror – 1
 - .5 Towel shelf with hanger rod – 1
 - .6 Towel ring - 1
 - .6 Shower curtain rod – 25mm stainless steel rod with mounting brackets
 - .7 Shower curtain – by Owner
- .2 Barrier-Free Washroom 125 (universal washroom)
 - .1 Toilet paper holder – 1
 - .2 Towel ring – 1 per washroom
 - .3 Grab Bars – (x1) 760mm x 760mm L-shaped grab bar and (x1) rear 610mm grab bar, as indicated
 - .4 Robe Hook – x2 (mount one at 1100mm AFF)
 - .5 Fixed Mirror - 1
 - .6 Liquid soap dispenser – 1
 - .7 Waste Receptacles – by Owner

3.3 General

- .1 Locate accessories where indicated on drawings and as per OBC Barrier Free requirements. Coordinate exact locations with consultant if not otherwise indicated.

END OF SECTION

1 GENERAL

1.1 Read and conform to:

- .1 Comply with Division 1 requirements and documents referred to herein.

1.2 Description of Work

- .1 Work consists of fabricating and installing counter tops, splash backs, shelves and other associated components shown on Drawings and as specified herein.

1.3 Related Work Specified Elsewhere

- .1 Supply only of self-rimming stainless-steel sinks and cup sink types required under Section 11605.

1.4 Related Sections

- .1 Section 01395 - Environmental Goals
- .2 Section 01610 - Basic Product Requirements
- .3 Section 06400 – Architectural Woodwork
- .4 Section 11600 - General Provisions

1.5 References

- .1 LEED Reference Guide v2.1 (as published by the US Green Council).

1.6 Submittals

- .1 Shop Drawings: Submit completely detailed shop drawings of counter tops for review in accordance with 3 samples of plastic laminate in the colour and laboratory grade with backing sheet.
- .2 Submit for approval manufacturer's catalogue literature related to installation, fabrication for piping, fittings, valves and calking recommendations.

1.7 Product Handling

- .1 Crate all tops for shipping, handling, and storage.
- .2 Protect plastic laminate finishes with Kraft paper wrappings.
- .3 Protect stainless steel finishes with removable plastic protector coating.

2 PRODUCTS

2.1 General

- .1 Where splash backs, returns, shelves and supports occur in island, peninsula assemblies or similar assemblies, provide identical material for such items to match counter tops as specified herein for materials and quality of work except where noted on Drawings as being different materials from top material.
- .2 Where ends of tops butt against a wall, a blank side of a cupboard, sides of fume hoods, or service duct enclosures, provide return splash back.

2.2 Stainless Steel Counter Tops Type 316

- .1 Fabricate of 18 Ga [1.2 mm] stainless steel as per Section 11600.
- .2 Reinforce and sound-deaden with a 3/4" [19mm] thick, waterproof, medium density particleboard core, bonded with Helmiprene #C8185-2 contact adhesive. Seal underside of core with waterproof sealing coat. Build up outer edges of tops with solid wood strips to a thickness of 1-1/4" [32 mm].
- .3 Provide a raised rim or marine edge 1" [25 mm] wide along front edges and exposed or open ends. From inner edge of the 1" [25 mm] wide surface, provide a downward slope of 30° with a vertical drop of 1/4" [6 mm]. Extend stainless steel under counter top a minimum of 1/2" [13 mm] and form a drip edge.
- .4 Form splashback integrally where noted on Drawings with the tops radiused from the horizontal. Bond splash backs to particleboard core as with the tops to finished thickness of 3/4" [19 mm].
- .5 Fabricate tops in lengths as shown on drawings and, where necessary to join in field, provide field-welded joints properly ground and finished to a perfect, smooth surface indistinguishable from surrounding surfaces
- .6 Welding shall be by the Argon Arc process. Fillers, solders or spot-welding will not be permitted. Make welds continuous, crevice free, ground and polished to the original #4 satin finish. At right angle return tops, joints shall be mitred at 45°, and polishing and graining shall follow the 45° joint line.
- .7 Refer to Section 11604 for detailed specifications on stainless steel sinks and drainboards.
- .8 Stainless steel counter tops butting to other top materials shall be square, return edge faced same as front edge and drilled for installation of tite-joint fasteners, epoxy or silicone joint sealants.
- .9 Fabricate stainless steel shelves and reagent shelves in same manner as tops but using 3/4" [19mm] core.
- .10 Integrally weld stainless steel sinks and cup sinks into counter tops without visible seams or joints. Spray sound-deadening undercoater to underside.
- .11 Provide fluted and/or sloped drainboards, as noted on drawings, sloped to sinks, integrally welded to tops and sinks without visible seams, joints, or warping.

3 EXECUTION

3.1 INSTALLATION

- .1 Install tops in accordance with reviewed shop drawings, securing them in position by rigid, concealed fixing methods, which allows no movement, or rocking on completion
- .2 Joints between 2 lengths of tops of either similar or dissimilar material shall be level, flush and shall form a waterproof sealed joint. Install same types of tops to each other using bead of sealant and tite-joint fasteners. Clean sealant from exposed surfaces in a manner precluding surface damage.
- .3 Sink cut-outs for self rimming sinks shall be cut only so large as to permit entry of sink into counter top, allowing sink rim to lay flush on top yet providing sufficient material for maximum

-
- support on all edges. Cut-outs shall be radialized corner cuts to prevent splitting of the laminate. Angled corner cuts are unacceptable.
- .4 Where applicable sink cutouts and drilled holes for service fittings shall be factory and field sealed when required with appropriate edge sealant from count top cores.

END OF SECTION

DOOR AND FRAME SCHEDULE

PROJECT: DPSSSAB Esprit Place Renovation

PROJECT NO. 2356

DATE: February 9, 2024

General Notes:

Solid core wood doors and frames to have maximum 1/4" (6mm) undercut

| REFERENCE NO. | | DOOR | | | | | FRAME/SCREEN | | | | | ULC LABEL | HDWE | REMARKS |
|--|------------------------|------|-------|-----|-----------|-------|--------------|-------|-----|-------|-------|-----------|----------------------------------|---------|
| NO. | ROOM | TYPE | MAT | FIN | WIDTH | HT | TYPE | MAT | FIN | WIDTH | HT | | | |
| LEVEL 000, BASEMENT, DRAWING A3.0 | | | | | | | | | | | | | | |
| D000 | STORAGE | B | SCW | PT | 2'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D001 | EXIT STAIR | B | SCW | PT | 2'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D003 | CORRIDOR | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LOCKSET | |
| D003A | CORRIDOR | B | SCW | PT | 2 X 2'-4" | 6'-8" | 3 | WD | PT | | | | | |
| D003B | CORRIDOR | B | SCW | PT | 2 X 1'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D003C | CORRIDOR | B | SCW | PT | 2 X 1'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D003D | CORRIDOR | B | SCW | PT | 2 X 1'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D004 | STORAGE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D006 | OFFICE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D008A | STORAGE | EX | EX HM | PT | 3'-0" | 6'-8" | EX | EX HM | PT | | | | | |
| D008B | STORAGE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D009 | ELECTRICAL ROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D010 | MULTIPURPOSE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D011 | WASHROOM | B | SCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D012 | OFFICE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| LEVEL 100, MAIN LEVEL, DRAWING A3.1 | | | | | | | | | | | | | | |
| D100A | VESTIBULE | A | HMI | PT | 3'-2" | 7'-0" | 1 | HMI | PT | 3'-6" | 7'-2" | | | |
| D100B | VESTIBULE | A | HM | PT | 3'-2" | 7'-0" | 2 | HM | PT | 4'-8" | 7'-2" | | | |
| D101 | STAIR | B | SCW | PT | 3'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D103 | CORRIDOR | B | SCW | PT | 2'-8" | 6'-8" | 3 | WD | PT | | | | | |
| D103A | CORRIDOR | B | SCW | PT | 2 X 1'-6" | 6'-8" | | WD | PT | | | | | |
| D104A | OFFICE/SUPERVISIION | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |
| D104B | OFFICE/SUPERVISIION | A | HM | PT | 3'-0" | 7'-0" | 1 | HM | PT | 3'-4" | 7'-2" | | | |
| D105A | BEDROOM - BARRIER-FREE | B | SCW | PT | 3'-0" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D105B | BEDROOM - BARRIER-FREE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D105C | CLOSET | B | SCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D106 | LOUNGE | B | SCW | PT | 3'-0" | 6'-8" | 1 | WD | PT | | | | | |
| D109 | WASHROOM | B | SCW | PT | 3'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D110 | LAUNDRY | B | SCW | PT | 2'-6" | 6'-8" | 3 | WD | PT | | | | | |
| D111 | CLOSET | B | SCW | PT | 1'-8" | 6'-8" | 3 | WD | PT | | | | | |
| D112A | VESTIBULE | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | | |

PROJECT: DPSSSAB Esprit Place Renovation
 PROJECT NO. 2356
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| REFERENCE NO. | | DOOR | | | | | FRAME/SCREEN | | | | | ULC LABEL | HDWE | REMARKS |
|--|-----------------|------|-----|-----|--------|-------|--------------|-----|-----|--------|-------|-----------|----------------------------------|---------|
| NO. | ROOM | TYPE | MAT | FIN | WIDTH | HT | TYPE | MAT | FIN | WIDTH | HT | | | |
| D112B | VESTIBULE | A | HM | PT | 3'-2" | 7'-0" | 1 | HM | PT | 3'-6" | 7'-2" | | | |
| D113 | CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| LEVEL 200, UPPER LEVEL, DRAWING 3.2 | | | | | | | | | | | | | | |
| D201 | EXIT STAIR | C | HM | PT | 2'-8" | 7'-0" | 1 | HM | PT | 3'-0" | 7'-2" | | | |
| D202A | CORRIDOR CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D202B | CORRIDOR CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D203 | WASHROOM | B | SCW | PT | 2'-6" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET | |
| D204 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D204A | BEDROOM CLOSET | B | HCW | PT | 2'-2" | 6'-8" | 3 | WD | PT | | | | | |
| D205 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D205A | BEDROOM CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D205B | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D206 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D206A | BEDROOM CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D207 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D207A | BEDROOM CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D208 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D208A | BEDROOM CLOSET | B | HCW | PT | 2'-0" | 6'-8" | 3 | WD | PT | | | | | |
| D208B | BEDROOM | B | SCW | PT | 2'-0" | 6'-8" | 4 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D209 | BEDROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET, CLOSER | |
| D210 | WASHROOM | B | SCW | PT | 2'-10" | 6'-8" | 3 | WD | PT | | | | LEVER PRIVACY LOCKSET | |
| D211 | MECH. CLOSET | A | HM | PT | 2'-6" | 7'-0" | 1 | HM | PT | 2'-10" | 7'-2" | | | |

| ABBREVIATIONS | | | | | | | |
|---------------|---------------------------|------------|------------------------|------------|-----------------|------------|---|
| AL | ALUMINUM | HM | HOLLOW METAL | SCW | SOLID CORE WOOD | CL | CLOSER |
| TBAL | THERMALLY BROKEN ALUMINUM | HMI | HOLLOW METAL INSULATED | EX | EXISTING | ES | ELECTRONIC SECURE ACCESS (KEY FOB OR SIMILAR) |
| CA | CLEAR ANODIZED | HCW | HOLLOW CORE WOOD | ST | STAIN | PDO | POWER DOOR OPERATOR |
| BA | BRONZE ANODIZED | PT | PAINT | TG | TEMPERED GLASS | TBD | TO BE DETERMINED (ON SITE) |

ROOM FINISH SCHEDULE

PROJECT: DPSSSAB Esprit Place Renovation
 PROJECT NO.: 2356
 DATE: February 28, 2024

| ROOM | | FLOOR | | | | WALL (directions listed according to Drawing Orientation) | | | | | | | | CEILING BULKHEAD | | CEILING | | | REMARKS |
|------------------------------|----------------------|------------------------|------|----------|------|---|-----|--------------|-----|--------------|-----|--------------|-----|------------------|-----|--------------|-----|-------|--|
| | | EXISTING TO BE REMOVED | | NEW | | NORTH | | SOUTH | | EAST | | WEST | | MAT'L | FIN | MAT'L | FIN | HT | |
| | | MAT'L | BASE | MAT'L | BASE | MAT'L | FIN | MAT'L | FIN | MAT'L | FIN | MAT'L | FIN | | | | | | |
| LEVEL 000, BASEMENT | | | | | | | | | | | | | | | | | | | |
| 000 | STORAGE | LVT | WD | | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | EX | Replace entire flooring, & wall base with new. |
| 001 | EXIT STAIR | LVT | WD | RB / LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | EX | Replace all stair treads and risers with rubber materials. Repaint all GWB and painted wood. Existing stair & mid-landing finishes to be new LVT. |
| 002 | CORRIDOR | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-9" | Replace entire flooring, wall base & ceiling with new. Wrap existing beam with rated GWB. |
| 003 | CORRIDOR/SERVICES | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 7'-9" | Replace entire flooring, wall base with new. |
| 004 | STORAGE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 7'-9" | Replace entire ceiling with new. |
| 006 | OFFICE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | EXIST GWB | PT | 7'-9" | Construct new GWB bulkhead below existing ceiling. |
| 007 | STORAGE | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 7'-9" | |
| 008 | STORAGE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | EXIST GWB | PT | 7'-9" | Construct new GWB bulkhead below existing ceiling. |
| 009 | ELECTRICAL ROOM | LVT | WD | LVT | WD | GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-9" | Existing ACT ceiling to be removed. Install new rated GWB ceiling with exposed ductwork. |
| 010 | MULTIPURPOSE ROOM | LVT | WD | LVT | WD | GWB | PT | GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-9" | Replace entire flooring, wall base & ceiling with new. |
| 011 | WASHROOM | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-9" | Replace entire flooring, wall base & ceiling with new. |
| 012 | OFFICE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | - | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 7'-9" | |
| LEVEL 100, MAIN FLOOR | | | | | | | | | | | | | | | | | | | |
| 100 | VESTIBULE | LVT | WD | CT | CT | EXIST GWB | PT | EXIST GWB | PT | EX BR | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Restore all disturbed areas to match existing. |
| 100A | INTERVIEW AREA | LVT | WD | CT | CT | EXIST GWB | PT | EXIST GWB | PT | EX BR | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Restore all disturbed areas to match existing. |
| 101 | EXIT STAIR | LVT | WD | RB | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | EX | Replace all stair treads and risers with rubber materials. Repaint all GWB and painted wood. Existing stair & mid-landing finishes to be new LVT. Protect existing wainscotting around perimeter walls to approx 42" AFF. |
| 102 | SECURE VESTIBULE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | EXIST GWB | PT | 8'-0" | Construct new GWB bulkhead below existing ceiling. Protect existing wainscotting around perimeter walls to approx 42" AFF. |
| 103 | CORRIDOR | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Repaint all GWB and pre-painted wood. Patch ceiling. Protect existing wainscotting around perimeter walls to approx 42" AFF. |
| 104 | OFFICE/SUPERVISION | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | EXIST GWB | PT | 8'-0" | Restore all disturbed areas to match existing. Construct new GWB bulkhead below rated ceiling. |
| 105 | BEDROOM BARRIER-FREE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Restore all disturbed areas to match existing. |
| 106 | LOUNGE | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. Replace existing ceiling with new rated GWB ceiling below u/s of framing. Construct new GWB bulkhead below rated ceiling. |

| ROOM | | FLOOR | | | | WALL (directions listed according to Drawing Orientation) | | | | | | | | CEILING BULKHEAD | | CEILING | | | REMARKS |
|-------------------------------|------------|------------------------|------|-------|------|---|-----|--------------|-----|--------------|-----|--------------|-----|------------------|-----|--------------|-----|-------|--|
| NO. | NAME | EXISTING TO BE REMOVED | | NEW | | NORTH | | SOUTH | | EAST | | WEST | | MAT'L | FIN | MAT'L | FIN | HT | |
| | | MAT'L | BASE | MAT'L | BASE | MAT'L | FIN | MAT'L | FIN | MAT'L | FIN | MAT'L | FIN | | | | | | |
| 107 | DINING | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. Replace existing ceiling with new rated GWB ceiling below u/s of framing. Construct new GWB bulkhead below rated ceiling. |
| 108 | KITCHEN | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. Replace existing ceiling with new rated GWB ceiling below u/s of framing. Construct new GWB bulkhead below rated ceiling. Remove existing wall tile and repair GWB. |
| 109 | WASHROOM | LVT | RB | SSHV | CT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 8'-0" | Replace entire flooring, wall base, ceiling with new. |
| 110 | LAUNDRY | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base with new. Exposed ductwork and HRV within room. |
| 111 | CORRIDOR | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. Construct new GWB bulkhead below rated ceilings. |
| 112 | VESTIBULE | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base with new. |
| 113 | CLOSET | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base with new. |
| LEVEL 200, UPPER LEVEL | | | | | | | | | | | | | | | | | | | |
| 201 | EXIT STAIR | LVT | RB | RB | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace all stair treads and risers with rubber materials. Repaint all GWB and painted wood. Existing stair & mid-landing finishes to be new LVT. |
| 202 | CORRIDOR | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | GWB | PT | EXIST GWB | PT | 7'-2" | Replace entire flooring, wall base & ceiling with new. Lower partial GWB ceiling for mech. |
| 203 | WASHROOM | LVT | RB | SSHV | CT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-6" | Replace entire flooring, wall base & ceiling with new. Lower GWB ceiling for mech. |
| 204 | BEDROOM 1 | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 205 | BEDROOM 2 | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 206 | BEDROOM 3 | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 207 | BEDROOM 4 | LVT | RB | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 208 | BEDROOM 5 | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 209 | BEDROOM 6 | LVT | WD | LVT | WD | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | EXIST GWB | PT | 8'-0" | Replace entire flooring, wall base & ceiling with new. |
| 210 | WASHROOM | LVT | RB | SSHV | CT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | EXIST GWB | PT | | | GWB | PT | 7'-6" | Replace entire flooring, wall base & ceiling with new. Lower GWB ceiling for mech. |
| 211 | HRV CLOSET | LVT | RB | LVT | WD | GWB | PT | GWB | PT | GWB | PT | GWB | PT | | | EXIST GWB | PT | 7'-2" | Replace entire flooring, wall base & ceiling with new. Lower GWB ceiling for mech. |

GENERAL NOTES:

- NEW DRYWALL IS NOTED AS GWB. EXISTING DRYWALL IS NOTED AS EXIST GWB. REFER ALSO TO PLANS FOR SCOPE OF NEW AND/OR EXISTING GWB.
- Where existing materials are being removed and/or modified, prepare all existing conditions for new finishes to suit.
- SEE REFLECTED CEILING PLANS FOR BULKHEAD LOCATIONS AND SCOPE.

| ABBREVIATIONS | | | | | | | | | |
|---------------|-------------------------|-------|--------------------------|-----|------------------|------|--|------|-------------------------------------|
| ACT | ACOUSTICAL CEILING TILE | CT | PORCELAIN / CERAMIC TILE | GWB | GYPSUM WALLBOARD | RCP | | SPEC | SEE SPECIFICATIONS |
| BLKHD | BULKHEAD | EXIST | EXISTING | PT | PAINT | SC | | WD | WOOD |
| BR | BRICK | EXP | EXPOSED STRUCTURE | RB | RUBBER BASE | SSHV | | - | EXISTING TO REMAIN / NOT APPLICABLE |