Government of Canada
Building Renovation

Red Deer, Alberta

Issued for Bid
March 8, 2019

PROJECT MANUAL

Issued by

Stantec

Division 01 - General Requirements

Division 02 - Existing Conditions

Division 03 – Concrete

Division 04 – Masonry

Not Used

Division 05 - Metals

Not Used

Division 06 - Wood, Plastics and Composites

Division 07 - Thermal and Moisture Protection

END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Bid Package comprises general interior renovation to the Government of Canada Building, located at Red Deer, Alberta for the Government of Canada. Work of this package includes the construction of the building and related sitework.

.2 Work specified in Specifications is divided into Divisions and Sections for reference purposes only. Except as may be otherwise specified in Bid Document, division of work among Contractor, Subcontractors, Sub-subcontractors and suppliers is Bidders' responsibility

1.2 CONTRACT METHOD

.1 Construct Work under single stipulated price contract.

.2 Relations and responsibilities between Contractor and subcontractors assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:

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

.2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Departmental Representative.

.3 The successful bidder shall become the “prime contractor” for the purposes of Alberta health and safety regulations when Substantial Performance is executed.

1.3 WORK SCHEDULE

.1 Provide Substantial Completion of the work of this project by dates as indicated in Division 00 documents.

1.4 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.

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

.3 Work of Project executed during Work of this Contract, and which is specifically excluded from this Contract:

.1 Furniture.

.2 Kitchen Appliances.

.3 As indicated on Drawings

1.5 WORK SEQUENCE

.1 Maintain fire access/control.

1.6 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work, for storage, and for access, to allow:

- .1 Owner occupancy.
- .2 Partial owner occupancy.
- .3 Work by other contractors.
- .4 Public usage.

.2 Co-ordinate use of premises under direction of Departmental Representative.

.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.

.6 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.7 OWNER FURNISHED ITEMS

.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.
- .2 Review shop drawings, product data, samples, and other submittals. Submit to Departmental Representative notification of 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).

.3 Schedule of Owner furnished items:

.1 As indicated

1.8 DOCUMENTS REQUIRED

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

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 List of Outstanding Shop Drawings.

.6 Change Orders.

.7 Other Modifications to Contract.

.8 Field Test Reports.

.9 Permits

.10 Copy of Approved Work Schedule.

.11 Health and Safety Plan and Other Safety Related Documents.

.12 Other documents as specified.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Closures: protect work temporarily until permanent enclosures are completed.

1.3 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian and vehicular traffic.

.3 Provide alternative routes for pedestrian and vehicular traffic if required.

.4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

.5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.6 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.7 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.9 Record locations of maintained, re-routed and abandoned service lines.

.10 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

.1 Hours of Operation: Building is occupied from 08:00 to 16:00 hours on week days. Coordinate work schedule with Owner and building manager.

.2 Carry out noise generating Work Monday to Friday from 18:00 to 07:00 hours and on Saturdays, Sundays and statutory holidays.

.3 Submit schedule in accordance with Section 01 32 16 – Construction Schedule.

.4 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.5 Keep within limits of work and avenues of ingress and egress.

.6 Ingress and egress of Contractor vehicles at site is limited to area as indicated.

1.5 SECURITY CLEARANCES

.1 Contractor and Subcontractors shall sign in and out each day at the front desk as indicated in Terms and Conditions.

1.6 BUILDING SMOKING ENVIRONMENT

.1 Smoking is not allowed.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.2 APPOINTMENT AND PAYMENT

.1 Owner will appoint and pay for services of testing laboratory except follows:

- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.
- .5 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

- .1 Provide access to Work for inspection and testing.
- .2 Facilitate inspections and tests.
- .3 Make good Work disturbed by inspection and test.
- .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Coordinate between mechanical and electrical work, and work of other affected Sections in accordance with the requirements of this Section and other affected sections.

1.2 RELATED SECTIONS

.1 Section 07 84 00 – Firestopping and Smokeseals

.2 Divisions 21, 22 and 23 – Common Work Results: Common work results for fire suppression, plumbing, and heating, ventilating and air conditioning systems

.3 Division 25 – Common Work Results: Common work results for integrated automation.

.4 Divisions 26, 27 and 28 – Common Work Results: Common work results for electrical, communications, and electronic safety and security.

.5 Section 26 50 00 – Lighting: Coordination of lighting installation with other mechanical and electrical systems.

1.3 MECHANICAL-ELECTRICAL WORK COORDINATOR

.1 Contractor shall be responsible for providing a person technically qualified and experienced in field coordination for the type of mechanical and electrical work required for this Project, for duration of construction work.

.2 Mechanical and Electrical Coordination shall be performed by a dedicated person other than the Contractor's Project Manager; who shall have extensive experience with coordinating complex mechanical and electrical work and shall be acceptable to the Departmental Representative.

1.4 SUBMITTALS

.1 Provide required coordination documents before submitting shop drawings, product data and samples; provide information required by this Section in accordance with Section 01 33 00.

.2 Preparation of Mechanical and Electrical Coordination Drawings specified in this Section form a part of the Contractor's Submission requirements and are specifically excluded from the Mechanical and Electrical Subcontractor's Scope-of-Work as follows:

.1 Mechanical and Electrical Subcontractors shall allow for full assistance and cooperation with the General Contractor in the provision of all required information for the assembly of Coordination Drawings.

.2 Mechanical and Electrical Coordination Drawings described in this Section form a part of the General Contractor's Scope-of-Work.

.3 Submit name, qualifications, and related experience of proposed Mechanical-Electrical Coordinator to the Departmental Representative before any Work starts on site; Departmental Representative reserves the right to reject any candidate that does not appear suitable for this Project.

.4 Submit field coordination drawings for mechanical and electrical work above ceilings for all floor levels, including penthouse and mechanical and electrical

rooms, supplemented with building cross sections indicating mechanical and electrical systems fully coordinated with structural drawings and details, and coordinated with architectural finish components such as ceilings, bulkheads, furring, casework and equipment, indicating ductwork, piping, conduit, and equipment in their intended locations, coordinated with all other parts of the Work and highlighting potential interference between systems and building components.

Part 2 Products

2.1 COORDINATION DOCUMENTS

.1 Prepare Field Coordination Plan and Section Drawings indicating coordination for the following:

.1 Installation of subgrade plumbing work.

.2 Installation of above ceiling mechanical and electrical work coordinated with the structure and architectural ceiling heights for efficient use of available space, for proper sequence of installation, and to resolve interferences.

.3 Scale:

.1 Plans: Not less than 1:50 metric.

.2 Sections: Not less than 1:20 metric.

.3 Details: Not less than 1:10 metric.

.4 Clearly indicate changes to the location, direction, route or grade of mechanical and electrical work shown in the Contract Documents that are required or necessary arising from the coordination of the Work.

.5 Reproduce and distribute copies at Coordination Meeting to each concerned party in accordance with Section 01 31 19.

.6 Update and revise as necessary after each Coordination Meeting.

.2 Maintain coordination documents throughout construction period, recording changes arising from modifications and adjustments; submit finalized coordination documents after completion of Project in accordance with Section 01 78 00.

Part 3 Execution

3.1 MECHANICAL AND ELECTRICAL COORDINATION

.1 Coordinate work between Divisions 2 to 14 inclusive and Divisions 21 to 28.

.2 Coordinate progress schedules, including dates for submittals and for delivery of products.

.3 Conduct conferences between Subcontractors, other contractors and other concerned entities as necessary to establish and maintain coordination and schedules and to resolve matters identified by coordination activities.

.4 Participate in Progress and Coordination Meetings; report on work requiring adjustment under coordination requirements, and any needed changes in schedules or in the work to resolve interferences between components of the Work.

.5 Transmit minutes of coordination to all attendees and concerned individuals in accordance with Section 01 31 19.

.6 Implementation of changes required as a result of coordination activities shall be performed as follows:

.1 Work Considered as No Change to Contract: Changes that **do not** materially increase or decrease the Scope-of-Work of the Contract, shall not be considered as additional work under Contract.

.2 Work Considered as Change to Contract: Changes that **do** materially increase or decrease the Scope-of-Work of the Contract, will be administered as a Change to the Contract in accordance with General Conditions of Contract.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 The Departmental Representative shall Schedule and administer project meetings throughout the progress of the work.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within two days after meetings and transmit to meeting participants and affected parties not in attendance.

.8 Representative of Contractor, subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING (CONSTRUCTION PARTNERING WORKSHOP)

.1 Within 30 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Representatives of Owner, Departmental Representative, Contractor, major subcontractors, suppliers listed in bid form, field inspectors and supervisors will be in attendance.

.3 Coordinate time and location of meeting and notify parties concerned minimum two days before meeting.

.4 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with Construction Progress Schedules.

.3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.

.5 Delivery schedule of specified equipment.

.6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.8 Owner provided products and salvaged items as indicated on drawings.

.9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.

.10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

.11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

.12 Monthly progress claims, administrative procedures, photographs, hold backs.

.13 Appointment of inspection and testing agencies or firms.

.14 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work schedule progress meetings every two weeks.

.2 Contractor, major subcontractors involved in Work, Departmental Representative, and Owner are to be in attendance.

.3 Notify parties minimum 5 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 7 days after meeting.

.5 Agenda to include 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 affect on construction schedule and on completion date.

.12 Other business.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

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

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

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

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

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

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

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

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

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

1.2 REQUIREMENTS

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

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

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

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

1.3 SUBMITTALS

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

.2 Submit to Departmental Representative within 15 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

1.4 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Shop Drawings, Samples.
.3 Permits.
.4 Mobilization.
.5 Slab on grade.
.6 Interior Architecture (Walls, Floors and Ceiling).
.7 Plumbing.
.8 Lighting.
.9 Electrical.
.10 Piping.
.11 Controls.
.12 Heating, Ventilating, and Air Conditioning.
.13 Millwork.
.14 Fire Systems.
.15 Testing and Commissioning.
.16 Building Flushout (IAQ)
.17 Supplied equipment long delivery items.
.18 Engineer supplied equipment required dates.

1.5 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule every two weeks reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.6 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of Alberta, Canada as required.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 10 working days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Delete information not applicable to project.

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

.19 If upon review by Departmental Representative, 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 resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.3 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's business address.

.3 Notify Departmental Representative 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 Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative 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.

1.4 MOCK-UPS

.1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

1.5 PHOTOGRAPHS: DIGITAL FORMAT

.1 Progress Photographs

.1 Sizes: minimum 2 mega pixel image file size, jpeg image file.

.2 Format: CD or DVD (*.jpg) or web based platform

.3 Viewpoints: A minimum of four (4) photographs from three (3) different viewpoints will be required. Minimum 20.

.4 Number of photo sets: one (1) set per month.

.5 Identification: referenced to photo file with name, location, purpose, and number of project and date of exposure.

.6 Viewpoints: interior and exterior locations: viewpoints determined by Departmental Representative.

.7 Frequency: at completion of excavation, foundation, framing, and services before concealment and at completion of each discrete phase of construction.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INTENT

.1 The intent of Delegated Design Submittals required by this section is to account for professional engineering responsibility for design, review and acceptance of components of Work forming a part of permanent Work in accordance with Building Code, and that has been assigned to a design entity other than Departmental Representative including, but not limited to, the following:

.1 Design requiring structural analysis of load bearing components and connections.

.2 Design requiring compliance with fire safety regulations.

.3 Design requiring compliance with life or health safety regulations.

.2 This section provides standard forms for submittal of Letter of Commitment and Letter of Compliance required complying with requirements of Building Code and design delegated to a professional Engineer within technical specification sections.

.3 Delegated Design Submittals are not required for components of Work requiring engineering for temporary Work (i.e.: crane hoisting, engineered lifts, false Work, shoring, concrete formwork) that would normally form a part of Contractor's scope of Work.

.4 The requirements of this section are in general conformance with recommended Responsibilities for Engineering Services for Building Projects published by Association of Professional Engineers, Geologists and Geophysicists of Alberta (APPEGA), with regards to duties of specialty professionals appointed during construction period.

.5 The requirements of this section do not diminish responsibilities of Departmental Representative's role as Registered Professional of Record; submittals will be used by Departmental Representative to establish that Work is substantially performed in accordance with Building Code.

1.2 RELATED SECTIONS

.1 Section 07 84 00 - Firestopping and Smokeseals

.2 Divisions 23 and 26 Coordinate with disciplines for items requiring delegated design submittals.

1.3 DELEGATED DESIGN

.1 Performance and Design Criteria: Provide products and systems complying with specific performance and design criteria indicated where professional design services or certifications by a design professional are specifically required of Contractor by Contract Documents.

.2 If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Departmental Representative.

.3 Delegated design will be required for elements designed by a specialty professional, which may include:

.1 Elements normally fabricated off-site

.2 Elements that require specialized fabrication equipment or a proprietary fabrication process not usually available at job site (i.e.: open web steel joists, wood trusses, combination wood and metal or plywood joists, prefabricated wood or metal buildings, noise and vibration isolation devices).

.3 Elements requiring civil engineering, not normally a part of scope of services performed by architectural; structural; mechanical; electrical; or geotechnical disciplines of Departmental Representative.

Part 2 Products

2.1 LETTER OF COMMITMENT

.1 Submit a signed and sealed Letter of Commitment on company letterhead addressed to Departmental Representative in accordance with format in Appendix A attached to the end of this Section prior to starting Work requiring design and seal of a professional engineer.

2.2 LETTER OF COMPLIANCE

.1 Submit a signed and sealed Letter of Compliance on company letterhead addressed to Departmental Representative in accordance with format in Appendix B attached to the end of this Section on completion of Work requiring design and seal of a professional engineer.

Part 3 Execution

3.1 IMPLEMENTATION

.1 Include summary of Work described in technical specification section as a part of the required Letter of Commitment.

.2 Prepare required submittals and present to Departmental Representative within sufficient time to allow for Departmental Representative’s detailed review and acceptance.

.3 In lieu of Items 2.1 and 2.2, National Building Code Compliance Schedules A, B, and C will be accepted.

END OF SECTION

APPENDIX A

LETTER OF COMMITMENT

Submit a signed and sealed letter of commitment on company letterhead in the form as follows:

[Date]

[Consultant]
[Consultant's Address]

Attention: [Consultant's Registered Professional of Record]

Re: Letter of Commitment for Delegated Design of [System of Component of Work]
[Name of Project]
[Project Number]
[City, Province]

As the retained registered professional engineer for design and field review of the above named component of Work and project, I hereby give assurance I am qualified to perform the following Work as required by Contract Documents:

1. [List appropriate design services for System or Component of Work];
2. Preparation of shop and erection documents;
3. Review fabrication of [structural] [fire rated] [life and health safety] components;
4. Review erection of [structural] [fire rated] [life and health safety] components.
5. [Modify list to suit System of Component of Work.]

I hereby give assurance that I will be responsible for above noted Work as described in Section [?????] – [Name of Section] of Project Manual, including requirements of addenda, change orders and change directives.

I also undertake to be responsible for field review of fabrication and erection of [structural] [fire rated] [life and health safety] components as required to ascertain substantial compliance with the Building Code and Contract Documents.

I will notify you in writing if my responsibility is terminated at any time during the course of Work covered by this Letter of Commitment.

Retained Professional Engineer

_____
Signature

_____
Date

(Apply seal)

APPENDIX B

LETTER OF COMPLIANCE

[Date]

[Consultant]
[Consultant's Address]

Attention: [Consultant's Registered Professional of Record]

Re: Letter of Compliance for Delegated Design of [System of Component of Work]
[Name of Project]
[Project Number]
[City, Province]

I hereby give assurance that I have fulfilled my obligations for field review as outlined by previously submitted Letter of Commitment.

I hereby give assurance that aspects of [structural] [life and health safety] Work as defined by previously submitted Letter of Commitment substantially comply with Contract Documents and Building Code.

Retained Professional Engineer

_____
Signature

_____
Date

(Apply seal)

Part 1 General

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of Alberta

.1 Occupational Health and Safety Regulations, Act and Code 2018.

1.2 SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.

.4 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 7 days after receipt of comments from Departmental Representative.

.8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 SAFETY REQUIREMENTS

.1 Contractor shall verify that emergency procedures including appropriate First Aid facilities and First Aid personnel are in place at the Work Site.

.2 Contractor shall also have access to the Owner's First Aid Facilities. Conditions for use will be reviewed at the Project Start-up Meeting.

.3 Contractor shall employ a full time, on-site Construction Safety Officer (CSO) who is responsible for the following:

- .1 Providing new employee orientation
- .2 Overseeing site activities
- .3 Providing appropriate training on personal protective equipment and Workplace Hazardous Materials Information System (WHMIS)
- .4 Conducting and documenting accident investigations as required
- .5 Conducting daily work site inspections
- .6 Conducting weekly site safety meetings, train new employees and verifying that Subcontractors, sub-subcontractors, suppliers and others working on the site are aware of safety requirements
- .7 Requirement for a full time, on-site CSO may be waived where it can be shown that the site superintendent is certified and trained to act as the Safety Officer.
- .8 CSO shall be certified by a training program recognized by the Alberta Construction Safety Association.

.4 Maintain on site sufficient quantities of PPE, including but not limited to: hard hats, safety glasses, hearing protection and other items of clothing or special equipment as necessary to verify that visitors to the site, the Departmental Representative are adequately protected.

.5 Verify that all Contractor's employees, Subcontractors, sub-subcontractors, suppliers and others working on the site, meet clothing requirements of shirts with sleeves no shorter than midway between shoulder and elbow and full length pants; muscle shirts or sleeveless shirts, cut-offs or shorts will not be allowed on the work site.

1.5 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative and Owner prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act of Alberta.

1.10 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.11 PRIME CONTRACTOR

.1 Responsibility for Work Site Safety - This Contractor Is "Prime Contractor":

.1 The Contractor shall, for the purposes of the Occupational Health and Safety Act (Alberta), and for the duration of the Work of this Contract:

.1 Be the "Prime Contractor" for the "Work Site", and

.2 Meet all requirements of the Occupational Health and Safety Act and Regulations, Workers Compensation Board legislation, the Fire Code legislation and all other applicable laws that govern work place safety.

.2 The Contractor shall direct all Subcontractors, sub-subcontractors, Other Contractors, employees, suppliers, workers and any other persons at the “Work Site” on safety related matters, to the extent required to fulfill its “Prime Contractor” responsibilities pursuant to the Act, regardless of:

.1 Whether or not any contractual relationship exists between the Contractor and any of these entities, and

.2 Whether or not such entities have been specifically identified in this Contract.

.3 Safety Certification: Safety certification is a condition of contract award; Contractor is required to maintain a valid Certificate of Recognition (COR) for the duration of the Work of this Contract.

1.12 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.13 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

.1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.

1.15 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.16 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan, include:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for

marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.3 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.4 DISPOSAL OF WASTES

.1 Strictly adhere to requirements of Section 01 74 21 Waste Management and Disposal. Do not bury rubbish and waste materials on site unless approved by Departmental Representative.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.5 DRAINAGE

.1 Provide erosion and sediment control plan that identifies type and locations of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measure are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sedimentations control plan.

.3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.4 Do not pump water containing suspended materials into waterways or drainage systems. Migration to water retention pond is allowed.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated on Drawings and in Specifications.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.7 WORK ADJACENT TO WATERWAYS

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material.

.3 Do not dump excavated fill, waste material or debris in waterways.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

.6 Avoid indicated spawning beds when constructing temporary crossings of waterways.

.7 Do not blast under water or within 100 m of indicated spawning beds.

1.8 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.9 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with Alberta Building Code 2014 and the National Building Code (NBC) 2015 including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 All references to codes, standards and standard specifications referred to in these Specifications or used on drawings shall mean and intend to be the currently adopted edition, amendment and revision of such reference standards in effect at the time of Bid closing.

.2 In the event that the most current version of a code, standard or standard specification differs from the version indicated in these Specifications:

1. Report the discrepancy to the Construction Manager and Departmental Representative immediately.
2. The most current standard at time of Tender will be used to establish the quality of the work or material being referenced.

.3 Referenced standards and code requirements shall be considered minimum requirements only. The Specifications may indicate additional requirements in excess of those established by referenced codes and standards.

.4 Applicable portions of Standards used that are not in conflict with the Contract Documents are hereby made a part of the Specifications.

.5 Modifications or exceptions to Standards shall be considered as amendments, and unmodified portions shall remain in full effect.

.6 In cases of discrepancies between the Specifications and Standards, the requirements of the Specification shall govern.

.7 In cases of discrepancies between Codes and the Specifications, the Code requirements shall govern.

.8 Where references to Codes or Standards are used in these Specifications, the Subcontractors must familiarize themselves with the applicable portions and shall be governed by the requirements affecting the Project.

.9 The Subcontractor shall provide an affidavit, when requested by the Construction Manager and/or the Departmental Representative, from manufacturers certifying that materials or products delivered to the project meet the requirements specified. Such certifications, however, shall not relieve the Subcontractors from the responsibility of complying with any added requirements specified in the Contract Documents.

1.2 STANDARDS EQUIVALENCY

A. Documents were prepared in the United States of America and in Canada. Reference standards used to establish performance requirements listed in the technical specifications for Work of the Project were prepared using mixed reference standards from the United States and Canada, whereby Canadian will take precedence.

.1 National Standards of Canada: Standards Referenced within the National Building Code are National Standards of Canada as accepted by the Standards Council of Canada and enforced by the Authority Having Jurisdiction.

.2 Technical Specification Content: The Departmental Representative has modified and referenced the correct listings of Referenced Standards

within the technical specifications where they reference National Standards of Canada applicable to work governed by the National Building Code.

.3 Names of Standards Organizations: Bilateral standards published in the United States of America and containing the word “American” when referenced as National Standards of Canada have the same weight as a standard containing the word “Canadian”:

.1 Country of testing origin does not prejudge the acceptability of the listed standards.

.2 All standards listed in the technical specifications are listed alphabetically, with no preference for country of origin.

.2 Materials, assemblies or systems that are tested in the United States using reference standards acceptable to Standards Council of Canada, with no equivalent Canadian reference standards are acceptable for use in Work of the Project using manufacturers’ standard product data and testing meeting the listed reference standards.

.3 Provide materials, assemblies or systems meeting Canadian reference standards acceptable to Standards Council of Canada where manufacturers conduct testing concurrently with reference standards published in the United States; and that are different than Canadian reference standards.

.4 Submit product data indicating Canadian equivalent performance to specified United States reference standards as follows:

1. Submit product data listing CSA, CGSB, ULC or similar reference standard indicating testing acceptable to the Authority Having Jurisdiction.
2. Use same material, assembly or system as would be required for a tested material, assembly or system specified for the project; substitutions will not be permitted unless evidence of equivalency is confirmed.
3. Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site; include manufacturer's printed instructions for installation.

1.3 STANDARDS ORGANIZATIONS

.1 The following list of standards organizations indicate the most common standards that may be referenced within the technical specifications:

.1 ANSI - American National Standards Institute

.2 ASTM - American Society for Testing and Materials

.3 CGA - Canadian Gas Association

.4 CGSB - Canadian General Standards Board

.5 CSA - Canadian Standards Association

.6 CAN1 - National Standard of Canada (published by CGA)

.7 CAN2 - National Standard of Canada (published by CGSB)

.8 CAN3 - National Standard of Canada (published by CSA)

.9 CAN4 - National Standard of Canada (published by ULC)

.10 ULC - Underwriters Laboratories of Canada

.11 UL or ULI - Underwriters Laboratories Inc.

.12 NFPA - National Fire Protection Agency

.13 WHI - Warnock Hersey | Intertek Testing Services

.2 The following limitations on marks issued by standards organizations will apply to the standards issued by the organizations listed in above:

.1 Underwriters Laboratories Inc.: Only systems designated by “cUL” or “cULus” will be acceptable for use on this project. Systems indicating “UL” or “ULus” will only be considered where local authorities having jurisdiction have reviewed and accepted the systems in writing.

.2 Warnock Hersey Intertek: Only materials designated by “cWHI” or “cWHIus” will be acceptable for use on this project. Materials bearing a “WH”, “WHI” or “WHIus” mark will only be considered where local authorities having jurisdiction have reviewed and accepted the materials in writing.

.3 Subcontractor will be responsible for obtaining written acceptance of materials and submitting them to the Departmental Representative prior to installation.

1.4 ABBREVIATIONS

.1 Additional Technical Societies, Associations, or Standards may be referenced in these Specifications in addition to the following abbreviations:

Name of Association	Abbreviation
Acoustical Materials Association	AMA
Air Movement & Control Association	AMCA
American Concrete Institute	ACI
American Iron & Steel Institute	AISI
American Society of Heating, Refrigerating and Airconditioning Engineers	ASHRAE
American Society of Mechanical Engineers	ASME
American Standards Association	ASA
American Wood Preservers' Association	AWPA
Architectural Woodwork Manufacturers Association of Canada	AWMAC
Canadian Institute of Steel Construction	CISC
Ceilings and Interior Systems Construction Association	CISCA
Canadian Sheet Steel Building Institute	CSSBI
Canadian Welding Bureau	CWB
Construction Specifications Canada	CSC
Factory Mutual	FM
Heating, Refrigerating and Airconditioning Institute of Canada	HRAI
Hydronics Institute	HI
Industrial Fabric Association International	IFAI
Insulated Glass Manufacturers Association of Canada	IGMAC
Master Painters Institute	MPI
National Association of Architectural Metal Manufacturers	NAAMM
National Building Code	NBC

Name of Association	Abbreviation
National Lumber Grades Authority	NLGA
Northwest Wall and Ceiling Bureau	NWCB
Terrazzo, Tile & Marble Association of Canada	TTMAC
The Society for Protective Coatings	SSPC

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INSPECTION/FIELD REVIEW

.1 Allow Departmental Representative 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.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 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.

.4 Departmental Representative will order 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.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Owner for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection or testing, appointed agency will request additional inspection or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Owner. Pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

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

.2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

.1 Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays 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.

1.5 REJECTED WORK

.1 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 Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.6 REPORTS

.1 Submit electronic copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.7 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Refer to Section 01 45 00 for Mock-ups required for Air Leakage / Compartmentalization Testing.

.3 Construct in locations acceptable to Departmental Representative or as specified in specific Section.

.4 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.5 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.6 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.

.7 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.

.8 Mock-ups may remain as part of Work.

.9 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 MILL TESTS

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

1.10 EQUIPMENT AND SYSTEMS

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

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

.1 SMACNA 008-2008 (Chapter 3), IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition.

1.2 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT PLAN

.1 The intent of this plan is to prevent construction and future indoor air quality problems that may result from construction affecting the comfort and well being of construction workers and building occupants.

.2 The provision of the Construction Indoor Air Quality Management Plan or IAQ Management Plan is the responsibility of the Contractor.

.3 Provide a fully developed IAQ Management Plan implemented through construction and pre-occupancy of the building including the following activities:

.1 Meet or exceed the recommended Design Approaches in SMACNA 008 (Chapter 3) and other requirements as detailed in this specification during all construction activities. These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation.

.2 Protect all stored and installed absorptive materials from moisture or dust, chemical and gas damage as specified in Section 01 61 00 - Basic Product Requirements.

.3 Construction use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, de-humidification, humidification, dust control or any other use is strictly prohibited.

.4 Replace all filtration equipment for air handling units, heat recovery ventilators and fans with new filter media as specified within the technical specification sections in Division 23 at the end of construction.

.4 Provide the following submittals to the requirements of Section 01 33 00 - Submittal Procedures:

.1 IAQ Management Plan:

.1 Provide a draft documented IAQ Management plan in writing for review by the Engineer within 21 days of award of contract.

.2 The IAQ Management Plan submission is to include:

.1 Details of each management plan strategy including:

.1 The Design Approaches in SMACNA 008 (Chapter 3) including:

.1 HVAC Protection

.2 Source Control procedures.

.3 Pathway Interruption.

.4 Housekeeping.

.5 Scheduling.

.6 Reporting.

.2 Samples of reporting documents based SMACNA 008 (Chapter 3).

.3 Methods for protecting all stored and installed absorptive materials from moisture or dust, chemical and gas damage.

.4 Declaration that air handling units, heat recovery ventilators, fans or any associated equipment and systems will not be used during construction for ventilation, heating, de-humidification, humidification and dust control.

.5 Schedule for filter replacement as a component of the building startup and Commissioning.

.3 Format: submit 5 copies of reports, each in "D" ring binders, complete with index tabs for verification and review by Engineer.

.4 Make changes or additions to the draft IAQ Management Plan within the specified plan requirements to the satisfaction of the Engineer and reissue as final draft.

.5 Distribute the final IAQ Management Plan to all trades working on the site.

.2 Construction Reporting

.1 During the course of construction provide the following reporting to the Engineer for review:

.1 Photographs indicating the general conformance to the IAQ Management Plan.

.2 Completed Planning Checklist for all trades on the project indicating scheduling and the requirements of IAQ procedures with respect to scheduled construction activities for that week.

.3 Inspection sheets completed by the Site Superintendent reviewing that all trades completed the scheduled requirements of the IAQ procedures for that week including any deficiencies and corrective actions taken.

.2 Provide all reporting on a weekly basis unless otherwise approved by the Engineer during periods of low IAQ risk construction or low construction activity.

.5 Provide the following close out submittals to the requirements of Section 01 78 00 - Closeout Submittals:

.1 Provide all IAQ Management Plan submittals including the following:

.1 The final version of the Construction IAQ Management Plan.

.2 Digital copies of all weekly photographs in a CD ROM Format.

.3 All weekly planning checklists.

.4 All weekly inspection sheets.

.5 Format: submit 5 copies of closeout report, each in "D" ring binders, complete with index tabs for verification and review by Engineer.

.6 Provide the following activities specified to meet or exceed the recommended Design Approaches in SMACNA 008 (Chapter 3) during all construction

activities. These design approaches shall be applicable for all buildings regardless of whether it is a new construction or renovation:

.1 HVAC Protection:

.1 Use of air handling units, heat recovery ventilators, fans or any associated equipment and systems for ventilation, heating, de-humidification, humidification, dust control or any other use during Construction is strictly prohibited.

.2 Seal off all supply, return and exhaust air system openings to prevent the accumulation of dust and debris in the systems at all times unless work is being completed on the immediate area of the system using plastic seals to the approval of the Engineer. This is to include overnight and longer work stoppages. All diffusers, grilles, and displacement ventilators are also to be sealed in plastic.

.3 Protect all stored and installed absorptive materials from moisture and dust, chemical and gas damage as specified in Section 01 61 00 – Basic Product Requirements.

.4 Keep all operable doors on all air handling units closed at all times unless work is being completed on the immediate area of the system.

.5 Do not store construction or waste materials in Fan and Mechanical Rooms.

.6 Keep all construction areas clean and neat as specified elsewhere in this specification.

.7 Replace all filtration equipment for air handling units, heat recovery ventilators and fans with new filter media as specified with the technical specification sections in Division 22 at the end of construction.

.8 Where ducts become contaminated due to inadequate protection these ducts will be cleaned professionally as specified in Division 23.

.2 Source Control:

.1 Use of low VOC products as specified elsewhere are to be utilized at all times.

.2 Restrict traffic volume and idling of motor vehicles where emissions could be drawn into the building.

.3 Direct fired construction heaters are not acceptable. Vent all construction heater products of combustion to the outdoors.

.4 Cycle heating equipment off when not being used or needed.

.5 Exhaust all pollution sources to the outside with portable fan systems ensuring exhaust does not re-circulate back into the building.

.6 Keep containers of wet products closed as much as possible. Cover and seal waste materials, which can release odour or dust.

.3 Pathway Interruption:

.1 Prevent dust from migrating to other areas with the use of dust curtains or temporary enclosures where applicable.

.2 Relocate pollutant sources as far away as possible from construction ventilation equipment, stored materials and areas occupied by workers when feasible. Any construction supply and exhaust systems that ventilate both areas where pollutant sources are being used and areas where they are not been used should be shut down or isolated during such activity with supplemental construction ventilation provided as required.

.3 Isolate during construction, areas of work to prevent contamination of clean or occupied areas. Utilize pressure differentials generated by mechanical means to prevent contaminated air from entering clean areas.

.4 Ventilate contaminated air from construction areas directly to the outside during installation of VOC emitting materials.

.4 Housekeeping:

.1 Cleaning activities are specified in Section 01 74 11 however provide special emphasis on HVAC equipment and building spaces to remove contaminants from the building prior to operation of any permanent ventilation equipment.

.2 Keep all coils, filters, fans and ductwork clean during installation as specified and clean all prior to performing the Testing, Adjusting and Balancing of the systems.

.3 During construction suppress dust with wetting agents or sweeping compounds. Use efficient and effective dust collecting methods such as a damp cloth, wet mop, and vacuums with particulate filters, or wet scrubbers.

.4 Remove accumulations of water inside the building during construction. Protect all porous materials such as insulation and ceiling tile from exposure to moisture.

.5 Scheduling:

.1 Schedule work to ensure dust emitting work does not coincide with installation of absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example) that may act as 'sinks' for dust.

.2 Do not schedule any construction activities that would require the use of VOC or dust emitting activities during occupancy without the approval of the Engineer.

.3 Schedule all use of VOC emitting and high odorous materials BEFORE installing absorbent materials (ceiling tiles, gypsum wall board, fabric furnishings, carpet and insulation, for example) that may act as 'sinks' for VOCs, odours and other contaminants.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 2003 U.S. EPA Construction General Permit.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 DEWATERING

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

1.5 WATER SUPPLY

.1 Provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

.3 Pay for utility charges at prevailing rates.

1.6 TEMPORARY HEATING AND VENTILATION

.1 Refer to Section 01 47 18 Indoor Air Quality and follow requirements for implementation of Indoor Air Quality Management Plan.

.2 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.3 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.

.4 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture 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.

.5 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.

.6 Ventilating:

.1 Meet requirements of Section 01 47 18 Indoor Air Quality.

.2 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.3 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.4 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.5 Ventilate storage spaces containing hazardous or volatile materials.

.6 Ventilate temporary sanitary facilities.

.7 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.7 Permanent heating system of building, to be used when available. Be responsible for damage to heating system if use is permitted.

.8 On completion of Work for which permanent heating system is used, replace filters and bearings as required. Thoroughly clean permanent equipment used during construction.

.9 Ensure 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 certified by Departmental Representative.

.10 Pay costs for maintaining temporary heat, when using permanent heating system.

.11 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Meet requirements of Section 01 47 18 Indoor Air Quality.

.2 Conform with applicable codes and standards.

.3 Enforce safe practices.

.4 Prevent abuse of services.

.5 Prevent damage to finishes.

.6 Vent direct-fired combustion units to outside.

.12 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.7 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.

.2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

.4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

.5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to

electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.8 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, and data hook up, lines and equipment necessary for own use.

1.9 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 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete, Includes Updates through No. 3 August 2006.

.2 CSA-0121-08 (R2013), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-M87(R2003), Access Scaffolding for Construction Purposes.

.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.

.4 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 2003 U.S. EPA Construction General Permit.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

1.5 HOISTING

.1 Provide, operate and maintain hoists cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists cranes to be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.7 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.8 SECURITY

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

.2 Provide fencing and additional security as deemed necessary.

1.9 OFFICES

.1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

.4 Departmental Representative's Site office:

.1 Provide temporary office for Departmental Representative.

.2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 - 50% opening windows and one lockable door.

.3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.

.4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

.5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10% upward light component.

.6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.

.7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one - 3 drawer filing cabinet, one plan rack and one coat rack and shelf.

.8 Maintain in clean condition.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in 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 manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.12 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Departmental Representative.

.2 Indicate on sign, name of Owner, Departmental Representative, Contractor, and Subcontractors, of design style established by Departmental Representative.

.3 No other signs or advertisements, other than warning signs, are permitted on site.

.4 Locate project identification sign as directed by Departmental Representative and construct as follows:

.1 Paint surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.

.2 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

.5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction or sediment and erosion control plan, specific to site, that complies with 2003 U.S. EPA Construction General Permit or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-08 (R2013), Douglas Fir Plywood.

.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosure using purpose made, prefabricated interlocking metal fence panels 2.1 m high.

.2 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.5 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

1.6 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.7 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, and ramps as may be required for access to Work.

1.8 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.9 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.11 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be born by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.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 disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative 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.

1.3 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative 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 Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 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 Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 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 Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative 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 Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.10 REMEDIAL WORK

.1 Refer to Section 01 73 00 - Execution Requirements.

.2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate 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.

1.11 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.12 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.

1.13 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.15 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.

.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.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INTENT

.1 Specification if performance based for quality of products and alternates will not be reviewed during bid. The product must meet the performance values described in the project manual.

1.2 RELATED SECTIONS

.1 Section 00 45 00 – Information Submittal Forms: List of Alternate Prices.

.2 Specification sections referencing this Section.

1.3 DEFINITIONS

.1 Acceptable Materials: The term Acceptable Materials is used to specify products by trade name, manufacturer, catalogue number, model number, or similar reference, and is used within the Project Manual as follows:

.1 Acceptable Materials listings are based on Departmental Representative's determination that materials meet specified requirements and opinion of applicability to the project requirements.

.2 Acceptable Materials listings are deemed to establish the standard of acceptance that Departmental Representative will consider appropriate for the Work.

.3 Any product listed in the Acceptable Materials listing may be used to establish the Bid Price.

.2 Basis-of-Design Materials: The term Basis-of-Design Materials is used to specify a specific material name, manufacturer, catalogue number, model number or similar reference and is used as follows:

.1 Basis-of-Design Materials are used to establish Departmental Representative's preference for a single source product listing based on performance, appearance or configuration.

.2 Use the Basis-of-Design Material to establish the Bid Price, unless an Addendum is issued adding additional Acceptable Materials.

.3 Basis-of-Design Materials designation does not limit the Contractor's ability to submit Proposed Substitutions in accordance with Substitutions requirements of this Section and specific performance requirements listed in Technical Specification Sections.

.3 Non-proprietary specification means a specification which includes descriptive, reference standard or performance requirements, or any combination thereof, but does **not** include proprietary names of products or manufacturers.

.4 Substitution means a proposal from a Contractor to provide a product, material, or item of equipment not specified in the Contract documents but functionally equivalent and readily exchangeable to a specified item; for consideration by Departmental Representative and Owner.

1.4 SUBMITTALS

.1 When requested by Departmental Representative, submit complete data substantiating compliance of a product with requirements of Contract Documents. Include the following:

.1 Product identification, including manufacturer's name and address.

.2 Written verification that the substitute products can be obtained, meet the performance required for the project, and meet requirements of the Building Code.

.3 Manufacturer's literature providing product description, applicable reference standards, and performance and test data.

.4 Samples, as applicable.

.5 Name and address of projects on which product has been used and date of each installation.

.6 For substitutions and requests for changes to accepted products, include in addition to the above, the following:

.1 Itemized comparison of substitution with named product(s). List significant variations.

.2 Designation of availability of maintenance services and sources of replacement materials.

1.5 PRODUCT OPTIONS

.1 For products specified by non-proprietary specification:

.1 Select any product, assembly or material that meets or exceeds the specified standards for products specified only by referenced standards and performance criteria.

.2 Acceptable Materials: Select any named product, assembly or material contained in the listing of Acceptable Materials.

.3 Basis-of-Design Materials: Use the named product contained in the Basis-of-Design Material listing, unless an addendum is issued indicating acceptance of additional Acceptable Materials.

1.6 SUBSTITUTIONS

.1 Contractor will assemble requests for substitutions requested by subcontractors and submit to Departmental Representative for review.

.2 Departmental Representative will review proposed substitute products for acceptability only when submitted by Contractor; Departmental Representative will not review requests submitted independently by subcontractors.

.3 No substitutions will be permitted without Departmental Representative's written acceptance; Contractor will be required to remove products and replace with specified materials or provide a credit to the value of the contract at Departmental Representative’s discretion where substitutions are found in the Work that have not been formally accepted by Departmental Representative and Owner.

.4 Departmental Representative is not obliged to accept any Proposed Substitution offered by Contractor, and reserves the right to dismiss any item with no further explanation.

.5 Substitute Products: Where substitute products are permitted, unnamed products may be accepted by Departmental Representative, subject to the following:

.1 Substitute products shall be the same type as, be capable of performing the same functions as, and meet or exceed the standards of quality and

performance of the named product(s). Substitutions shall not require revisions to Contract Documents nor to work of Other Contractors.

.6 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers may be accepted by Departmental Representative, subject to the following:

.1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturer(s). Substitutions shall not require revisions to Contract Documents nor to work of Other Contractors.

.7 In making a proposal for substitution the Contractor represents:

.1 That they have personally investigated the proposal and (unless the proposal explicitly states otherwise) determined that it performs in a similar way or is superior to the product or method specified.

.2 That the same guaranty will be furnished as for the originally specified product or construction method.

.3 That they will coordinate installation of the accepted substitute into the Work, making such changes in the Work as may be required to accommodate the change.

.4 That they will bear costs and waives claims for additional compensation for costs and time that subsequently become apparent arising out of the substitution.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Owner's identification of existing survey control points and property limits.

1.2 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.3 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.4 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.5 SUBMITTALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.6 SUBSURFACE CONDITIONS

.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit written request in advance of cutting or alteration which affects:

- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 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.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 62 00 – Product Options and Substitutions.

1.3 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.

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

1.4 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 wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.

.13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

.14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.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 marked separate bins for recycling. Refer to Section 01 74 21 - Waste Management and Disposal.

.7 Dispose of waste materials and debris off site.

.8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

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

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

.1 Clean work prior to final review by Departmental Representative.

.2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.3 Remove waste in accordance with Section 01 74 21 – Waste Management and Disposal.

.4 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.5 Prior to final review remove surplus products, tools, construction machinery and equipment.

.6 Remove waste products and debris including that caused by Owner or other Contractors.

.7 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

.8 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.9 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.

.10 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

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

.12 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.13 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.14 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.15 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.16 Remove dirt and other disfiguration from exterior surfaces.

.17 Clean and sweep roofs, gutters, areaways, and sunken wells.

.18 Sweep and wash clean paved areas.

.19 Clean equipment and fixtures to sanitary condition.

.20 Clean mechanical equipment including replacement of filters in accordance with Section 01 47 18 – Indoor Air Quality.

.21 Clean roofs, downspouts, and drainage systems.

.22 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.23 Remove snow and ice from access to building.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss Waste Management Plan and Goals.

.2 Waste Management Goal: 75 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Inert Fill: inert waste - exclusively asphalt and concrete.

.3 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.4 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.9 Separate Condition: refers to waste sorted into individual types.

.10 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

1.3 SUBMITTALS

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

1.4 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility.

.8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.

.1 Ship materials to site operating under Certificate of Approval.

.2 Materials must be immediately separated into required categories for reuse or recycling.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.7 Protect surface drainage, mechanical and electrical from damage and blockage.

.8 Separate and store materials produced during dismantling of structures in designated areas.

.9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off-site processing facility for separation.

.3 Provide waybills for separated materials.

1.6 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, and paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.

.2 Waste type of each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.7 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Provide temporary security measures approved by Owner.

1.8 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 SELECTIVE DEMOLITION

.1 Reuse of Building Elements: this project has been designed to result in end of project rates for reuse of building elements as follows: do not demolish building elements beyond what is indicated on Drawings without approval by Departmental Representative's.

3.2 APPLICATION

.1 Do Work in compliance with WRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.3 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.4 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Alberta	Alberta Environmental Protection Petroleum Plaza, South Tower 9915 - 108 th Street Edmonton AB T5K 2G8	780-427-2739	
	Alberta Special Waste Management Corporation Pacific Plaza, Suite 610 10909 Jasper Avenue NW Edmonton AB T5J 3L9	780-422-5029	780-428-9627

END OF SECTION

Part 1 General

1.1 INTENT

.1 A facility start-up process shall be used to bring the facility to a fully operational state, free of deficiencies, in the most efficient and timely manner achievable.

.2 Contractor shall be responsible for testing, adjusting and balancing of all:

.1 Piped, ducted, wired and wireless services and systems, including all components and equipment forming part thereof, and

.2 Manually and mechanically operated systems including all components and equipment forming part thereof.

.3 Perform starting of each system and each item of equipment in accordance with the general requirements specified in this section and is specific to facility start-up and commissioning of the facility.

.4 This section specifies additional requirements to those required for normal Contractor's start-up of equipment and systems as contained in the General Requirements of the Contract, and as follows:

.1 Perform and record tests to confirm proper performance and compliance with requirements of Contract Documents; take corrective action as necessary.

.2 Perform adjustments to ensure proper, efficient and safe operation.

.3 Perform balancing to ensure that the various parts of system are in a proper state of equilibrium.

.5 Performance Testing will begin after declaration of Substantial Performance as described in Section 01 77 00 – Closeout Procedures and will lead to Fine Tuning of equipment and systems.

.6 Fine Tuning will occur after declaration of Substantial Performance as described in Section 01 77 00 – Closeout Procedures and will lead to Final Acceptance of the Work.

.7 A Commissioning Authority will be employed by the Owner to act on the behalf of the Owner's representative will oversee the starting, testing, adjusting and balancing operations, and verify that equipment and systems are working as specified and within manufacturer's operating tolerances.

1.2 RELATED SECTIONS

.1 Section 01 77 00 – Closeout Procedures

.2 Section 01 79 00 – Demonstration and Training

1.3 QUALITY ASSURANCE

.1 Contractor shall perform testing, adjusting and balancing with Contractor's qualified personnel, or employ and pay for a qualified organization to perform such services.

.2 Perform testing, adjusting and balancing after starting of equipment and systems.

.3 Provide personnel, operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.

.4 Report to Departmental Representative any deficiencies or defects noted during testing, adjusting and balancing, which cannot be promptly corrected.

Part 2 Products

2.1 MANUFACTURER'S SITE SERVICES

.1 Provide manufacturers authorized representative when specified, or when requested by the Owner at site to do the following:

.1 Inspect, check and approve equipment and systems installation before starting.

.2 Supervise placing equipment and systems in operation.

.2 Manufacturers' authorized representative shall provide a written report verifying that equipment:

.1 Is properly installed and lubricated;

.2 Is in accurate alignment;

.3 Is free from any undue stress imposed by connecting lines or anchor bolts; and,

.4 Is being satisfactorily operated under load conditions.

Part 3 Execution

3.1 PREPARATION

.1 Have Contract Documents, shop drawings, product data, and operation and maintenance data at hand during starting process.

.2 Coordinate sequence for starting of various equipment and systems.

.3 Prepare each system and item of equipment for testing, adjusting and balancing.

.4 Verify that each systems and equipment installation is complete and in continuous operation.

.5 Verify ambient conditions.

3.2 FACILITY START-UP

.1 Contractor shall do the following during Facility Start-Up, not necessarily in order listed:

.1 Start equipment and systems as specified below.

.2 Test, adjust and balance equipment and systems as specified below.

.3 Demonstrate equipment and systems as specified in Section 01 79 00 – Demonstration and Training.

.4 Complete and submit Facility Start-Up report forms including:

.1 Contractor's system and equipment start-up reports.

.2 Testing, adjusting and balancing reports.

.3 Manufacturers' equipment start-up reports.

.5 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.

.6 Correct Contract Deficiencies identified as a result of the foregoing and as may be identified by the Owner.

.7 Execute Change Orders issued by the Owner.

.8 Perform all other work and activities required for fulfillment of prerequisites to Substantial Performance of the Work as specified in Section 01 77 00.

3.3 STARTING

.1 Verify that each item of equipment has been checked for proper lubrication; drive rotation, belt tension, control sequence, and other conditions affecting starting and operation; take corrective action as necessary.

.2 Execute starting under supervision of Contractor's personnel and, when specified or requested by Owner, manufacturer's authorized representative.

.3 Place equipment and systems in operation in proper sequence and in accordance with approved Contractor's Start-Up sub-schedule.

.4 Take corrective action as necessary.

3.4 TESTING, ADJUSTING AND BALANCING

.1 Testing: Perform tests to confirm compliance with requirements of Contract Documents. Take corrective action as necessary.

.2 Adjusting: Perform adjustments to ensure proper, efficient and safe operation.

.3 Balancing: Perform balancing to ensure that the various parts of system are in a proper state of equilibrium.

.4 Provide testing, adjusting and balancing of all:

.1 Piped, ducted, wired and wireless services and systems, including all components and equipment forming part thereof as identified in technical sections, and

.2 Manually and mechanically operated systems including all components and equipment forming part thereof.

.3 Comply with the requirements of all CSA, ASTM, ASHRAE, IEEE and other standards affecting their portion of the work to ensure that systems installed will meet the Owner's testing criteria.

.4 Copies of required standards shall be kept on site during installation and be available for viewing by the Contractor, the Departmental Representative and the Owner.

.5 Perform testing, adjusting and balancing after starting of equipment and systems.

3.5 FINE TUNING

.1 Fine tuning shall include, but not be limited to, the following:

.1 Air Balancing: final balancing.

.2 Water Balancing: final balancing.

.3 Fire Protection Systems: Verification of fire alarm system.

.4 Electrical Equipment and Systems: Testing of safety systems and devices.

.5 Other systems and equipment as identified in the technical sections.

.2 Fine tuning shall commence upon Owner's acceptance of Performance Testing results.

.3 Coordinate and cooperate with the Owner's Commissioning Authority Representative.

.4 Make necessary adjustments to comply with standards established by the Specifications ready for Owner's formalized verification and commissioning process.

.5 Contractor shall do the following during Fine Tuning:

.1 Correct all Contract Deficiencies previously outstanding and those identified during Fine Tuning.

.2 Execute Change Orders issued by Owner.

.3 Perform all other work and activities required for fulfillment of prerequisites to Final Acceptance of the Work as specified in Section 01 77 00.

.6 Owner will do the following during Fine Tuning:

.1 Conduct user surveys and take environmental measurements as necessary to identify existing and potential problems.

.2 Initiate Change Orders as required.

.3 Perform other activities related to Final Acceptance of the Work as specified in Section 01 77 00.

3.6 SEASONAL CONSTRAINTS

.1 Notwithstanding all-inclusive requirements specified in this Section, additional separate cycles of Facility Start-Up, Performance Testing and Fine Tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.

.2 Contractor's responsibilities with respect to such later Facility Start-Up activities shall be as specified in this Section.

3.7 PARTIAL UTILIZATION OF WORK

.1 Applicable requirements specified in this Section shall apply to the parts of the Work being utilized when partial utilization of the Work is required.

END OF SECTION

Part 1 General

1.1 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and that corrections have been made.

.2 Request Departmental Representative's review.

.3 Departmental Representative's Review: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.2 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Certificates required by Boiler Inspection Branch, Fire Commissioner, and Utility companies have been submitted.

.5 Operation of systems have been demonstrated to Owner's personnel.

.6 Work is complete and ready for final inspection.

.3 Final Review: when items noted above are completed, request final inspection of Work by Owner, Departmental Representative, and Contractor. If Work is deemed incomplete by Owner and Departmental Representative, complete outstanding items and request reinspection.

.4 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.5 Final Payment: when Owner and Departmental Representative consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to Contract. If Work is deemed incomplete by Owner and Departmental Representative, complete outstanding items and request reinspection.

.6 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with Contract.

1.2 CLEANING

.1 In accordance with Section 01 74 11 – Cleaning.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after final review, with Departmental Representative's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, three final copies of operating and maintenance manuals in English along with the full pdf version on two flash drives in English.

.6 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.

.7 Furnish evidence, if requested, for type, source and quality of products provided.

.8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.9 Pay costs of transportation.

.10 Submit `redline` marked up construction drawings to the Departmental Representative within 30 days of Substantial Performance and prior to final completion.

1.2 FORMAT

.1 Organize data as instructional manual.

.2 Binders: 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, process flow, 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.

1.3 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Departmental Representative 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 identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.4 AS-BUILTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to 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 Departmental Representative.

1.5 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of drawings, and in copy of Project Manual, provided by Departmental Representative.

.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: 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: 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.

1.6 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.7 REAL PROPERTY CERTIFICATE

.1 Supply to the Departmental Representative, as soon as construction of foundations and basic ground floor levels are completed, a survey plan from a registered Alberta Land Surveyor.

.2 Plan shall show dimensioned building plan at ground level, distance from property lines, and elevation of the floor used as datum.

.3 This includes all buildings in Contract.

1.8 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning (Cx) Requirements.

.15 Additional requirements: as specified in individual specification sections.

1.9 EXITING SIGNAGE

.1 Provide computer generated signage for emergency passage exiting of building. Provide minimum 305 x 305 mm size signs to include at locations as required by Authority having Jurisdiction for building exiting.

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, location as directed; place and store.

.4 Receive and catalogue items. Submit inventory listing to Departmental Representative. 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 items. Submit inventory listing to Departmental Representative. 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, location as directed; place and store.

.4 Receive and catalogue items. Submit inventory listing to Departmental Representative. 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.

.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 Departmental Representative.

1.15 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.

.3 Warranty management plan to include required actions and documents to assure that Owner receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, alarm systems, sprinkler systems, and lightning protection systems.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.10 Respond in a timely manner to oral or written notification of required construction warranty repair work.

.11 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.16 PRE-WARRANTY CONFERENCE

.1 Meet with Departmental Representative, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Departmental Representative.

.2 Departmental Representative will establish communication procedures for:

.1 Notification of construction warranty defects.

.2 Determine priorities for type of defect.

.3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.17 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 Demonstrate scheduled 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 co-ordinate their attendance at agreed-upon times.

1.2 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.

1.3 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Departmental Representative's approval.

.3 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.4 Give time and date of each demonstration, with list of persons present.

1.4 CONDITIONS FOR DEMONSTRATIONS

.1 Equipment has been inspected and put into operation.

.2 Testing, adjusting, and balancing has been performed in accordance with Requirements and equipment and systems are fully operational.

.3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.5 PREPARATION

.1 Verify that conditions for demonstration and instructions comply with requirements.

.2 Verify that designated personnel are present.

1.6 DEMONSTRATION AND INSTRUCTIONS

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

.2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.

.3 Review contents of manual in detail to explain aspects of operation and maintenance.

.4 Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instructions.

1.7 TIME ALLOCATED FOR INSTRUCTIONS

.1 Ensure amount of time required for instruction of each item of equipment or system as follows:

.1 Section 21 05 01 – Common Work Results - Mechanical: as required.

.2 Electrical System: as required.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 02 41 20 – Selective Interior Demolition

.2 Section 03 35 00 – Concrete Finishing

.3 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

.1 Definitions

.1 Cutting: Removal of existing construction necessary to permit installation or performance of other Work.

.2 Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 ACTION SUBMITTALS / INFORMATIONALSUBMITTALS

.1 Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

.1 Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.

.2 Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.

.3 Products: List products to be used and firms or entities that will perform the Work.

.4 Dates: Indicate when cutting and patching will be performed.

.5 Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.

.6 Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure to the Consultant prior to making cuts or modifications.

.7 Consultant's Acceptance: Obtain acceptance of cutting and patching proposal before cutting and patching. Review and acceptance of cutting and patching proposal does not waive right to later require removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

.1 Structural Elements: Do not cut and patch structural elements in a manner that could change their load carrying capacity or load deflection ratio.

.2 Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety, including but not limited to the following:

.1 Primary operational systems and equipment.

.2 Air or smoke barriers.

.3 Fire protection systems.

.4 Control systems.

.5 Communication systems.

.6 Electrical wiring systems.

.3 Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety, including but not limited to the following:

.1 Water, moisture, or vapour barriers.

.2 Membranes and flashings.

.3 Exterior curtain wall construction.

.4 Equipment supports.

.5 Piping, ductwork, vessels, and equipment.

.6 Noise and vibration control elements and systems.

.4 Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Consultant's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm, including but not limited to the following:

.1 Processed concrete finishes.

.2 Masonry.

.3 Ornamental metal.

.4 Firestopping and smokeseals.

.5 Finished flooring.

.6 Finished coatings.

.7 Wall covering.

.8 HVAC enclosures, cabinets, or covers.

.5 Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 WARRANTY

.1 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

Part 2 Products

2.1 MATERIALS

.1 General: Comply with requirements specified in other Sections of these Specifications.

.2 Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible:

.1 If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

Part 3 Execution

3.1 EXAMINATION

.1 Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed:

.1 Provide X-ray or other approved methods to determine locations of existing services and reinforcing in existing concrete slabs and block walls before cutting and renovations. Advise Consultant of findings before proceeding with the Work and revise penetration locations as required and directed by Consultant. Existing concrete slab thickness is to be confirmed by Contractor.

.2 Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

.3 Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Temporary Support: Provide temporary support of Work to be cut.

.2 Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

.3 Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

.4 Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

3.3 PERFORMANCE

.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay:

.1 Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

.2 Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations:

.1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

.2 Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

.3 Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond core drill.

.4 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

.5 Proceed with patching after construction operations requiring cutting are complete.

.3 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications:

.1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

.3 Floors and Walls: Where walls or partitions that are removed extend from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.

.4 Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

.5 Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

.6 Maintain existing fire ratings as required.

END OF SECTION

Part 1 General

1.1 INTENT

.1 This Section includes, but not limited to, the following:

.1 Demolition, removal completely from site, and disposal of all identified components, materials, equipment and debris.

.2 Selective demolition to allow new walls, bulkheads, ceilings and other materials to meet existing construction as indicated.

.3 Repair procedures for selective demolition operations.

.2 This Section does not include the following:

.1 Removal of hazardous materials or asbestos abatement.

.2 Demolition of exterior building components or structural elements.

.3 Mechanical or electrical equipment, except as required to make minor modifications to allow the work to be completed.

1.2 RELATED REQUIREMENTS

.1 Section 01 74 21 – Waste Management and Disposal

.2 Section 09 21 16 – Gypsum Board Assemblies

.3 Section 09 51 13 – Acoustical Panel Ceilings

.4 Section 09 65 00 – Resilient Flooring

.5 Division 20 – Mechanical

.6 Division 26 – Electrical

1.3 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A10.8-2011, Safety Requirements for Scaffolding.

.2 Canadian Federal Legislation

.1 Motor Vehicle Safety Act (MVSA), 1995

.2 Hazardous Materials Information Review Act, 1985

.3 Canadian Standards Association (CSA)

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

.4 National Fire Protection Association (NFPA)

.1 NFPA 241-2013, Standard for Safeguarding Construction, Alteration, and Demolition Operations.

.5 Provincial Legislation

.1 Legislation specific to Authority Having Jurisdiction for work governed by this Section

.6 Definitions

.1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.

.2 Remove and Salvage: Detach items from existing construction and deliver them to Owner.

.3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.4 Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Demolition Meeting: Conduct a pre-demolition meeting at Project site in accordance with requirements listed in Section 01 31 19 – Project Meetings, to confirm extent of salvaged and demolished materials; and to review Contractor's demolition plan prepared by a professional engineer.

.2 Coordination:

.1 Coordinate selective demolition work so that work of this Section adheres to aesthetic criteria established by the Drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.

.2 Coordinate with Owner's building manager and other tenants ongoing site operations, and limit the number of interruptions during regular business hours.

.3 Coordination with Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

.4 Coordination for shutoff, capping, and continuation of utility services.

1.5 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.2 Qualification Data: For firms and persons specified below to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses and other information specified.

.3 Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Owner reserves the right to make modifications where proposed methods interfere with the Owner's ongoing operations.

.4 Inventory: Submit a list of items that have been removed and salvaged after selective demolition is complete.

.5 Pre-demolition Photographs or Videotape: Submit photographs or videotape indicating existing conditions of adjoining construction and site improvements prior to starting Work. Include finish surfaces that may be misconstrued as damage caused by selective demolition operations.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: Perform work as follows; use most restrictive requirements where differences occur between the municipal, provincial and federal jurisdictions:

.1 Provincial and Federal Requirements: Perform work in accordance with governing environmental notification requirements and regulations of the Authority Having Jurisdiction.

.2 Municipal Requirements: Perform hauling and disposal operations in accordance with regulations of Authority Having Jurisdiction.

.2 Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project:

.1 Conform to the Workers Compensation Act and the Occupational Health and Safety Regulations under the Act.

.2 Conform to City of Red Deer bylaws and regulations governing this type of work.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

.2 Except where otherwise specified, all materials indicated or specified to be permanently removed from the Place of the Work shall become Contractor's property. Maximize to the fullest extent possible, salvage, and recycling of such materials, consistent with proper economy and expeditious performance of the Work.

.3 To reduce the quantity of material otherwise destined for disposal at a landfill, the Contractor is encouraged to consider utilizing the services of businesses and non-profit organizations that specialize in salvage and recycling of used building materials, but does so at his own option and risk.

.4 A current listing of recyclers specializing in specific categories of materials may be obtained during normal office hours from:

Alberta Environment
Recycling Branch
Recycle Info Line
Phone: (780) 427-6982 or 1-800-463-6326
Website:www.recyclinghotline.ca

1.8 SITE CONDITIONS

.1 Visit and examine the site and note all characteristics and irregularities affecting the work of this Section.

.2 Owner will occupy portions of building immediately adjacent to selective demolition area:

.1 Conduct selective demolition so that Owner's operations will not be disrupted.

.2 Provide not less than 72 hours notice to Owner of activities that will affect Owner's operations.

.3 Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities:

.1 Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

.4 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous as defined in the Hazardous Product Act be encountered, stop work, take preventative measures, and notify Consultant and Owner immediately.

Part 2 Products

2.1 TEMPORARY SUPPORT STRUCTURES

.1 Design temporary support structures required for demolition work and underpinning and other foundation supports necessary for the project using a qualified professional engineer registered or licensed in province of the Work.

2.2 DEBRIS

.1 Make all arrangements for transport and disposal of all demolished materials from the site.

2.3 EQUIPMENT

.1 Provide all equipment required for safe and proper demolition of the building.

2.4 REPAIR MATERIALS

.1 Use repair materials identical to existing materials:

.1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

.2 Use material whose installed performance equals or surpasses that of existing materials.

.3 Comply with material and installation requirements specified in individual Specification Sections.

.2 Floor Patching and Levelling Compounds: Cement based, trowelable, self-levelling compounds compatible with specified floor finishes. Gypsum based products are not acceptable for work of this Section.

.3 Prefinished Sheet Steel: Prefinished sheet steel, colour to match existing radiation cabinets, bent and profiled to match existing radiation cabinets.

.4 Gypsum Board Patching Compounds: Joint compound to ASTM C475, bedding and finishing types thinned to provide skim coat consistency to patch and prepare existing gypsum board walls ready for new finishes in accordance with Section 09 21 16 – Gypsum Board Assemblies.

.5 Hoarding and Dust Screens: Refer to Section 01 56 00 –Temporary Barriers and Enclosures for stud framing and gypsum board sheathing materials.

2.5 EXISTING MATERIALS

.1 Items to be retained for re-use in new construction include, but are not limited to the following:

.1 Items as indicated on Drawings.

.2 Confirm with Consultant any materials that appear to be in re-usable condition prior to disposal.

.3 Confirm with Consultant any materials scheduled for re-use that are not in re-usable condition prior to installation.

Part 3 Execution

3.1 EXAMINATION

.1 Inspect building with Consultant and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Verify that utilities have been disconnected and capped as required.

.3 Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

.4 Notify the Consultant where existing mechanical, electrical, or structural elements conflict with intended function or design:

.1 Investigate and measure the nature and extent of conflict and submit a written report to Consultant.

.2 Consultant will issue additional instructions or revise drawings as required to correct conflict.

.5 Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

.1 Identify and mark all equipment and materials identified to be retained by Owner or to be re-used in subsequent construction. Separate and store items to be retained in an area away from area of demolition and protect from accidental disposal.

.2 Post warning signs on electrical lines and equipment that must remain energized to serve other areas during period of demolition.

.3 Confirm that all electrical and telephone service lines entering building are not disconnected.

.4 Do not disrupt active or energized utilities crossing the demolition site.

.5 Provide and maintain barricades, warning signs, protection for workmen and the public during the full extent of the Work. Read drawings carefully to ascertain extent of protection required.

.6 Mark all materials required to be re-used, store in a safe place until ready for re-installation.

.7 Adjust all junction boxes, receptacles and switch boxes flush with new wall construction where additional layers to existing construction are indicated.

.8 Protection of In-Place Conditions

.1 Take precautions to guard against damage to adjacent work. Be liable for any damage or injury caused.

.2 Cease operations and notify Consultant if safety or any adjacent work appears to be endangered. Do not resume operations until reviewed with Consultant.

.3 Ensure safe passage of building occupants around and through area of demolition.

.4 Keep noise, dust, and inconvenience to occupants to minimum.

.5 Protect building systems, services and equipment.

.6 Provide temporary dust screens, covers, railings, supports and other protection as required.

.7 Provide and maintain fire prevention equipment and alarms accessible during demolition.

.8 Do Work in accordance with 01 35 29 – Health and Safety Requirements.

.9 Utility Services

.1 Coordinate existing services indicated to remain and protect them against damage during selective demolition operations.

.2 Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

.1 Arrange to shut off affected utilities with utility companies.

.2 If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.

.3 Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

.4 Cut off pipe or conduit to a minimum of 25 mm below slab, and remove concrete mound.

.3 Coordinate with mechanical and electrical sections for shutting off, disconnecting, removing, and sealing or capping utilities.

.4 Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 CONCRETE SLAB REINFORCING

.1 Locate location of reinforcing steel in concrete slabs prior to cutting or coring using non-destructive, non-ionizing radio frequency locators.

.2 Core concrete slabs to avoid reinforcing steel, electrical conduit or water pipes; adjust core location and coordinate with Engineer where slab features interfere with core drilling.

.3 Notify the Engineer immediately for further instructions where coring or cutting will damage existing slab features.

3.4 SELECTIVE DEMOLITION

.1 Demolish and dismantle work in a neat and orderly manner and in strict accordance with all regulations.

.2 At end of each day's work, leave Work in safe condition so that no part is in danger of toppling or falling.

.3 Demolish in a manner to minimize dusting and to prevent migration of dust.

.4 Selling or burning of materials on the site is not permitted.

.5 Remove concrete bases by cutting and chipping, take precautions against slab cracking and degradation. Grind edges smooth, fill and make level with self levelling grout.

.6 Fill all openings in concrete block walls with concrete masonry units, coursing to match existing, prepare ready to receive new finishes to match existing.

- .1 Provide bond beams in new openings cut into existing concrete masonry unit walls.
- .2 Provide finished end masonry units to patch and repair for new jamb sections in existing concrete masonry unit walls.

.7 Fill all openings in gypsum board walls with gypsum board and steel framing to match existing, skim coat to make wall smooth and even.

.8 Demolish existing flooring and adhesive remnants as follows:

- .1 Vacuum existing flooring thoroughly, prior to removal, using vacuum equipped with power head/sweeper.
- .2 Apply fine mist water spray to floors to minimize dust generation during removal. Avoid spraying near electrical outlets.
- .3 Demolish existing residual floor finishes, remove and dispose of off site.
- .4 Remove adhesive to the greatest extent possible using scrapping tools and as follows:
  - .1 Do not use solvent based cleaners to remove adhesive remnants.
  - .2 Lightly shot blast or grind floor using machine designed for purpose to remove adhesive remnants.
  - .3 Vacuum floor ready for application of skim coating.
  - .4 Repair all slab depressions and damage with cementitious patching compound.
  - .5 Skim coat floor with minimum 1 mm thick cementitious floor underlayment compatible with new flooring materials.
- .5 Floor substrate shall be smooth, free from ridges and depressions, and adhesive remnants that could telegraph through flooring materials.

.9 Demolish existing tile finishes. Remove setting bed or adhesive to the greatest extent possible using mechanical scrapping tools and as follows:

- .1 Saw cut edge of tile for clean and even transition joint between existing tile to remain and new flooring materials.
- .2 Lightly shot blast or grind floor to remove remnants of setting materials.
- .3 Vacuum floor ready for application of skim coating.

.4 Repair all slab depressions and damage with cementitious patching compound. Skim coat floor with minimum 1 mm thick cementitious floor underlayment compatible with new flooring materials.

.10 Demolish ceiling finishes as indicated on drawings.

.11 Remove all wall coverings scheduled for demolition. Patch and repair wall surfaces with skim coat of gypsum board joint compound leaving wall surfaces smooth and even ready for new wall finishes.

.12 Patch and repair all walls, floor and ceilings damaged during demolition with material matching adjacent walls, prepare ready for new finishes.

.13 Patch and repair all mechanical equipment and electrical fixtures damaged or exposed during demolition to match adjacent finished surfaces.

3.5 CORING, DRILLING AND SAW-CUTTING CONCRETE

.1 Complete an ultrasound inspection of affected concrete area before coring. Employ the services of an experienced inspector. Confirm with Owner before coring or drilling, location of reinforcing steel and raceways that may be present.

.2 Perform coring and drilling after normal working hours, unless specified otherwise. Confirm coring and drilling times with Owner.

.3 Wet or dry core drilling and saw-cutting are acceptable. Reduce amount of cooling water used to minimum required and collect water used in suitable containers, or use a suitable vacuum system that will collect water.

.4 Do not core structural beams or cut conduits or reinforcing steel without written permission from Landlord.

3.6 PATCHING AND REPAIRING

.1 Floors and Walls:

.1 Where walls or partitions that are demolished extend from one finished area into another, patch and repair floor and wall surfaces in the new space.

.2 Provide a level and smooth surface having uniform finish colour, texture, and appearance.

.3 Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.

.4 Patch with durable seams that are as invisible as possible.

.5 Provide materials and comply with installation requirements specified in other Sections of these Specifications.

.6 Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.

.7 When requested, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.7 CLEANUP

.1 Promptly as the Work progresses, and on completion, clean up and remove from the site all rubbish and surplus material. Remove rubbish resulting from demolition work daily.

.2 Maintain access to exits clean and free of obstruction during removal of debris.

.3 Keep surrounding and adjoining roads, lanes, sidewalks, municipal rights-of-way clean and free of dirt, soil or debris that may be a hazard to vehicles or persons.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 65 00 – Resilient Flooring.

1.2 REFERENCES

.1 American Concrete Institute (ACI):

.1 ACI 117/117M-10 (R2015), ACI Manual of Practice: Specifications for Tolerances for Concrete Construction and Materials, (ACI 117-10) and Commentary.

.2 ACI 301-16, Specification for Structural Concrete.

.3 ACI 302.1R-15, ACI Manual of Practice: Guide for Floor and Slab Construction.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM C881/C881M-15, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

.2 ASTM C979/C979M-16, Standard Specification for Pigments for Integrally Colored Concrete

.3 ASTM D1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.4 ASTM D1752-04a(2013), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.5 ASTM D2047-17, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-25.20-95, Surface Sealer for Floors.

.4 Canadian Standards Association (CSA)

.1 CSA-A23.1- 05/A23.2-14, Concrete Materials and Methods of Concrete Construction/Testing Methods and Standard Practices for Concrete, Includes Update No. 1 (2015).

.5 International Concrete Repair Institute (ICRI)

.1 ICRI 310.2R-2013, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays and Concrete Repair – Guide Only

.6 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113-16, Architectural Coatings.

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.1 Submit manufacturer's printed product literature, specifications and data sheet for each product specified.

.2 Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for concrete floor treatment materials. Indicate VOC content.

.3 Include application instructions for concrete floor treatments.

.2 Submit closeout data in accordance with Section 01 78 00 – Closeout Submittals.

.1 Provide manufacturer's printed recommendations for general maintenance, including cleaning instructions and submit a complete list of floor care products that will be required for on-going maintenance.

1.4 QUALITY ASSURANCE

.1 Performance Requirements

.1 Product quality and quality of work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Submit written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Temporary lighting:

.1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 sq m of floor being treated.

.2 Electrical power:

.1 Provide sufficient electrical power to operate equipment normally used during construction.

.3 Work area:

.1 Make the work area water tight protected against rain and detrimental weather conditions.

.4 Temperature:

.1 Maintain ambient temperature of not less than 10 degree C from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

.5 Moisture:

.1 Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.

.6 Safety:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.7 Ventilation:

.1 Arrange for ventilation system to be operated during installation of concrete floor treatment materials by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities and in accordance with OH & S Regulations.

.3 Provide continuous ventilation during and after coating application.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

.1 Refer to Structural Drawings for Slab Cambers as these numbers will rule over the items below.

.2 F3-Finishing: Floors having a straightedge value of ±5 mm over 3050 mm; similar to CSA A23.1 Class C Slab Finishing.

2.2 LEVELLING MATERIALS

.1 Underlayment: Cementitious, self levelling, single component, polymer modified underlayment and manufacturer's low VOC recommended primer, for application thicknesses to a minimum feather edge to 13 mm; acceptable materials as follows:

.1 CustomTech TechLevel150, Custom Building Products

.2 Eucofloor SL160, by Euclid Chemical.

.3 Novoplan 2 Plus, MAPEI Inc.

.4 Sikafloor Level 125, Sika Canada Ltd.

.5 Sure-Flo ST, Gemite.

.2 Overlayment: Cementitious, self levelling, single component, polymer modified overlayment, for application thicknesses to a minimum of 13 mm to 25 mm; acceptable materials as follows:

.1 CustomTech TechLevel150, Custom Building Products

.2 Sikafloor Level 25, Sika Canada Ltd.

.3 Sure-Flo FT 100, Gemite.

.4 Ultraplan 1 Plus, MAPEI Inc.

.3 Patching and Flash Patching Materials: Cementitious based, polymer modified, fine aggregate, single component, rapid curing, early strength floor patching compounds having high adhesion with manufacturer's recommended primer and surface profile; for application in thicknesses to a minimum of 4 mm to 25 mm, and as follows:

.1 Acceptable Materials:

.1 GenPatch, Custom Building Products

.2 NXT Patch, Laticrete

.3 Planitop 18 ES, MAPEI Inc.

.4 SD-P, Ardex

.5 SikaQuick 1000, Sika

.6 Sealtight Meadow-Crete H, W.R. Meadows

2.3 CRACK REPAIR MATERIALS

.1 Crack repair and filler: two-component, nonshrink, 100% solids, moisture-insensitive, VOC free, and meeting the requirements of ASTM C881.

.1 Basis-of-Design:

.1 Planibond EBA, MAPEI Canada Inc.

2.4 HARDENERS

.1 Type: 1, Sodium silicate, permanent penetrating sealer and hardener

.1 Liquid applied, water based, chemically reactive.

.2 Non-toxic, non-flammable, and anti-dusting have low or no VOC.

.3 Colour: colourless

.4 Acceptable Materials:

.1 Ashford Formula, Curecrete

.2 Euco Diamond Hard, Euclid Chemical Company

.3 Mapecrete Hard SB, Mapei Inc.

.4 Pentra-Hard, Dayton Superior Corporation

.5 Protech III, Cornerstone Coatings

.6 Seal Hard, L&M Construction Company

.7 Sealtight Liqui-Hard, W.R. Meadows

.8 Sikafloor 3S, Sika Canada

.2 Water: potable.

2.5 MIXES

.1 Mixing, ratios and application in accordance with manufacturers instructions.

Part 3 Execution

3.1 EXAMINATION

.1 Prepare floor surface in accordance with CSA A23.1.

.2 Verify that slab surfaces are ready to receive work and elevations are as instructed by manufacturer.

3.2 REPAIRS

.1 Inspect surfaces for defects immediately after removal of forms. Repair or patch defects within 48 hours of removal of forms with cure repairs same as new concrete with Consultants permission.

.2 Defective Areas: where patches are allowed, repair and patch areas to match surrounding areas in texture and colour.

3.3 PREPARATION OF EXISTING SLAB

.1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges unless otherwise indicated.

.2 Saw cut control joints to CSA-A23.1, 24 hours maximum after placing of concrete.

.3 The tops of all floor slabs, including slabs on grade, are to be brought to an even, level or sloping surface as indicated on the drawings, ready to receive the specified finish.

.4 The minimum floor flatness (F_F) required is to CSA-A23.1/A23.2, Table 16, Class A conventional smooth, straight edge tolerance $\pm$ 8mm, overall. F-number F_F20, F_L15, Waviness Index SWI 5mm.

.5 Interior floors indicated as exposed concrete are to be finished in accordance with the slab finishing schedule on the structural drawings. For slab areas not noted in the finishing schedule, slabs shall be smooth concrete with steel trowel finish.

.6 Depress floor slabs where shown and as required for floor finishes.

.7 Remove any curing agents used during concrete installation a minimum of 28 days prior to installation of flooring materials.

.8 Use mechanical stripping to remove chlorinated rubber or existing surface coatings.

.9 Use protective clothing, eye protection, and respiratory equipment during stripping of chlorinated rubber or existing surface coatings.

3.4 FINISHING FORMED SURFACES

.1 Requirements listed below apply to normal structural concrete; refer to Section 03 30 00 for additional requirements for formed exposed architectural concrete.

.2 Unspecified Finish: Provide following finishes as applicable when finish of formed surfaces is not specifically indicated:

.1 Unexposed Surfaces:

.1 Rough form finish for concrete not exposed to view.

.2 Smooth form finish for concrete to receive membrane waterproofing.

.2 Exposed Surfaces:

.1 Smooth form finish for concrete surfaces exposed to view.

.3 Rough Form Finish: Leave surfaces with texture imparted by forms; patch tie holes and defects; remove fins longer than 6 mm high.

.4 Smooth Form Finish: Coordinate as necessary to secure form construction using smooth, hard, uniform surfaces with number of seams kept to a minimum, uniformly spaced in an orderly pattern; patch tie holes and defects; completely remove fins.

.5 Related Unformed Finish: Strike-off concrete smooth and finish with using texture matching adjacent formed surfaces at tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces; continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces.

.6 Penetrating Sealer Finish: Apply penetrating sealer to vertical and overhead surfaces after any patching, joint sealing or caulking is completed in accordance with manufacturer’s written instructions.

3.5 FINISHING FLOORS AND SLABS

.1 Finish floors and slabs in accordance with CSA A23.1 and ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces; do not wet concrete surfaces.

.2 Float (Initial) Finishing:

.1 Consolidate surface with power driven floats or by hand floating if area is small or inaccessible to power driven floats.

.2 Re-straighten, cut down high spots, and fill low spots.

.3 Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.

.4 Apply float finishing to surfaces indicated.

.3 Trowel (Final) Finishing:

.1 Commence trowel finishing after all bleed water has disappeared and when the concrete has stiffened sufficiently to prevent the working of excess mortar to the surface.

.2 Apply first trowelling and consolidate concrete by hand or power-driven trowel after applying float finishing; continue trowelling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance; repair or smooth any surface defects that would telegraph through applied coatings or floor covering.

.3 Apply a trowel finishing to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.

.4 Finish surfaces to the tolerances indicated above.

3.6 APPLICATION: GENERAL

.1 After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.

.2 Apply floor treatment in accordance with Sealer manufacturer's written instructions.

.3 Clean overspray. Clean sealant from adjacent surfaces.

.4 Cure concrete in accordance with manufacturers recommended procedures.

3.7 APPLICATION: LIQUID APPLIED FLOOR HARDENER

.1 Apply liquid floor hardener in accordance with manufacturer's written instructions after initial floating.

.2 Cure concrete in accordance with manufacturer’s recommended instructions.

.3 Apply hardener to horizontal and vertical exposed concrete to remain unfinished.

3.8 PROTECTION

.1 Protect finished installation in accordance with manufacturer's instructions.

3.9 MAINTENANCE

.1 Provide training to Owners representative based on written manufacturers instructions as indicated in Section 01 78 00 – Closeout Submittals.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 91 00 - Painting

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM A153/A153M-16a, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- .2 ASTM A307-14e1, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- .3 ASTM A653/A653M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
- .4 ASTM C578-18, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- .5 ASTM C954-18, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
- .6 ASTM D1761-12, Standard Test Methods for Mechanical Fasteners in Wood.
- .7 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
- .8 ASTM F1482-15, Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- .9 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples

.2 American Wood Preservers Association (AWPA):

- .1 AWPA Book of Standards, 2016

.3 Canadian General Standards Board (CGSB)

- .1 CAN-CGSB 71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems (Withdrawn)

.4 Canadian Standards Association (CSA International)

- .1 CSA A123.2-03 (R2013), Asphalt-Coated Roofing Sheets.
- .2 CAN/CSA-A247-M86 (R1996), Insulating Fiberboard.
- .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 CAN/CSA-G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 CAN/CSA O80 Series-15, Wood Preservation
- .6 CSA O112 Series-M1977 (R2006), CSA Standards for Wood Adhesives.
- .7 CSA O121-17, Douglas Fir Plywood.
- .8 CSA O141-05 (R2014), Softwood Lumber.
- .9 CSA O151-17, Canadian Softwood Plywood.
- .10 CSA O153-13 (R2017), Poplar Plywood.

.11 CAN/CSA-O325-16, Construction Sheathing.

.12 CSA T530-99, Commercial Building Standard for Telecommunications Pathways and Spaces (Adopted ANSI/TIA/EIA-569-A)

.5 National Lumber Grading Association (NLGA):

.1 NLGA SPS2-2010, Special Products Standards on Machine Stress-Rated Lumber.

.2 Standard Grading Rules for Canadian Lumber 2010.

.6 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

.1 SCAQMD Rule 1113-16, Architectural Coatings.

.2 SCAQMD Rule 1168-05, Adhesive and Sealant Applications.

.7 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC S102.2-18, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 CAN/ULC-S770-15, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams.

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals:

.1 Submit manufacturer’s printed product literature, specifications and data sheets.

.2 Submit MSDS sheets or official manufacturer literature stating no urea-formaldehyde was used in the manufacturing of composite wood.

.2 Quality Control Submittals: Prior to covering exterior sheathing and shear walls, request structural engineer to review nailing patterns and provide confirmation report to Consultant.

1.4 QUALITY ASSURANCE

.1 Lumber shall be graded and stamped by an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver wood products bundled or crated to provide adequate protection during transit. Inspect wood products for damage upon delivery and remove and replace damaged materials.

.2 Store materials a minimum of 150 mm off the ground on blocking. Keep materials under cover and dry. Provide for air circulation within and around stacks and under temporary coverings.

.3 Protect sheet materials to prevent breaking of corners and damage to surfaces.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 PANEL MATERIALS

.1 Sheathing for structural shear wall and diaphragms:

.1 Plywood: Douglas Fir (DFP) or Canadian Softwood (CSP), Sheathing Grade, to CSA O121 or O151, thickness as indicated on drawings.

.2 Other sheathing:

.1 Fire Rated Plywood Panels to CSA O325, Class A fire retardant produced under Performance Standard PS-1, certified by the American Plywood Association.

.1 Acceptable Materials:

.1 Purekor Fire Retardant Plywood.

2.2 MISCELLANEOUS LUMBER

.1 Provide lumber for support or attachment of other construction, including furring, blocking, nailing strips, ground, rough bucks, cants, curbs, fascia, backing sleepers, and similar members.

.2 Fabricate miscellaneous lumber from dimension lumber of sizes indicated, and into shapes shown on drawings.

.3 Moisture Content: 19% maximum for lumber items not specified to receive wood preservative treatment.

.4 Grade: for dimension lumber sizes provide No. 2 or Standard grade lumber per NLGA. For board-sized lumber, provide sheathing grade, S2S.

2.3 WOOD PRESERVATIVE

.1 Where lumber or plywood is indicated as preservative treated or is specified to be treated, treated in accordance with CAN/CSA O80.9M and AWPA.

.2 Wood preservatives containing arsenic or chromium are not permitted.

.3 Pressure treat above ground items with waterborne preservatives to minimum retention of 4.0 kg/m^3. After treatment, kiln-dry lumber and plywood to maximum moisture content of 19% and 15% respectively. Treat indicated items and the following:

.1 Wood cants, nailing strips, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapour barriers, and waterproofing.

.2 Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry and concrete.

.3 Wood framing members less than 460 mm above grade.

.4 Wood floor plates installed over concrete slabs directly in contact with earth.

.4 Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to minimum of 6.4kg/m^3

.5 Fire-Retardant Treatment: to CAN/SCA O80.9M, CAN/CSA O80.20M and CAN/CSA O80.27M, pressure impregnated, and as follows:

.1 Flame Spread Classification: FSC 25 maximum.

.2 Smoke developed of not more than: 75.

.6 Complete fabrication of treated items before treatment where possible. If cut after treatment apply field treatment to cut surfaces.

.7 Wood Preservatives: Maximum allowable VOC limit 350 g/L in accordance with SCAQMD Rule #1113 - Architectural Coatings.

2.4 FASTENER FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for interior highly humid areas, pressure-preservative, and fire-retardant treated lumber.

2.5 ACCESSORIES

.1 Sealants: in accordance with Section 07 92 00 – Sealants.

.1 Maximum allowable VOC limit 250 g/L in accordance with SCAQMD Rule 1168.

.2 General purpose adhesive: to CSA O112 Series.

.1 Maximum allowable VOC limit 70 g/L in accordance with SCAQMD Rule 1168.

.3 Nails, spikes and staples: to CSA B111, hot dipped galvanized for exterior work and pressure preservative and fire retardant treated materials.

.4 Surface Applied Wood Preservative:

.1 Containing minimum 5% clear pentachlorophenol in accordance with CAN/CSA-O80 Series-M89.

.2 Apply minimum of 2 coats applied in accordance with manufacturers written instructions.

.3 Acceptable Materials:

.1 Osmose-Pentox Inc.

.5 Rough Hardware (bolts, nuts, washers, etc.): Hot dip galvanized in conformity to CSA G164 or Grade A low carbon steel, conforming to ASTM A307.

.6 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.7 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable.

Part 3 Execution

3.1 INSTALLATION

.1 Comply with requirements of Building Code 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 Install spanning members with "crown-edge" up.

.5 Install blocking at locations indicated to support washroom accessories.

.6 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, electrical equipment mounting boards, and other work as required.

.7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.8 Install sleepers as indicated.

.9 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

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 POWER, TELECOMMUNICATIONS AND DATA PANEL BOARDS

.1 Install 19 mm fire rated fir plywood boards on all walls in telephone and data rooms receiving wiring and equipment; minimum 1220 mm x 2440 mm panels on periphery walls over 300 mm wide, mounted 150 mm off of finished floor.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 The work of this section includes the supply installation of shop manufactured architectural woodwork.

.2 Cabinet hardware to be supplied by this section.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

.2 Section 08 14 16 – Wood Doors

.3 Section 09 21 16 – Gypsum Board Assemblies

.4 Section 09 65 00 – Resilient Flooring

.5 Section 09 91 00 – Painting

.6 Division 22 Mechanical: Sinks in countertops

.7 Division 26 Electrical

.8 Division 27 Communications

.9 Division 28 Electronic Safety and Security

1.3 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI/NPA A208.1-2009, Particleboard.

.2 ANSI/NEMA LD 3-2005, High-Pressure Decorative Laminates (HPDL)

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A240/A240M-17, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, and Strip for Pressure Vessels and for General Applications

.2 ASTM A480/A480M-17, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

.3 ASTM A666-15, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar

.4 ASTM D1037-12, Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

.5 ASTM D2555–17a, Standard Practice for Establishing Clear Wood Strength Values.

.6 ASTM D2559–12a (R2018) Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions.

.7 ASTM D2832-92(2016), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

.8 ASTM D3574-17, Standard Test Methods for Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams

.9 ASTM D3930–08(2015), Standard Specification for Adhesives for Wood-Based Materials for Construction of Manufactured Homes.

.10 ASTM D4300-01(2013), Standard Test Methods for Ability of Adhesive Films to Support or Resist the Growth of Fungi.

.11 ASTM D5116-17, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

.12 ASTM D5672/D5673M-15, Standard Test Method for Testing Flexible Cellular Materials Measurement of Indentation Force Deflection Using a 25-mm (1-in.) Deflection Technique

.13 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)

.1 AWMAC Architectural Woodwork Standards, Most Recent Edition

.4 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.1 CAN/CSA O80 Series-15, Wood Preservation

.2 CSA O112.9-10(R2014), Evaluation of Adhesives for Structural Wood Products (Exterior Exposure), Includes Update No. 1 (2011).

.3 CSA O112.10-08 (R2017), Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure), Includes Update No. 1 (2010), Update No. 2 (2010).

.4 CSA O115-M1982 (R2001), Hardwood and Decorative Plywood

.5 CSA O121-17, Douglas Fir Plywood.

.6 CSA O141-05 (R2014), Softwood Lumber.

.7 CSA O151-17, Canadian Softwood Plywood.

.8 CSA O153-13 (R2017), Poplar Plywood.

.5 International Organization for Standardization (ISO)

.1 ISO 14040:2006, Environmental Management-Life Cycle Assessment - Principles and Framework.

.2 ISO 14041:1998, Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.6 National Electrical Manufacturers Association (NEMA)

.1 ANSI/NEMA LD-3-2005, High-Pressure Decorative Laminates (HPDL),

.7 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress 2011.

.8 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2014.

.9 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

.1 SCAQMD Rule 1113-16, Architectural Coatings.

.2 SCAQMD Rule 1168-05, Adhesive and Sealant Applications.

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittals.

- .1 Show location of each item, dimensioned plans and elevations, large scale details, attachment devices, and other components.
- .2 Show details of construction, profiles, jointing, fastening and other related details.
- .3 Show materials, thicknesses, finishes and hardware.
- .4 Show locations and sizes of cut-outs and holes for plumbing fixtures and other items installed in architectural woodwork.

.2 Submit samples in accordance with Section 01 33 00 – Submittals.

- .1 Submit two (2) finished samples, 610 mm x 610 mm of each finish to be applied at the factory, to the Consultant for approval. Where materials are being matched, verify that specified materials match existing prior to submitting samples.
- .2 Alternative cabinet hardware from that specified shall be submitted to the Consultant for approval.
- .3 Reviewed samples shall become the standard for the work.

1.5 CLOSEOUT SUBMITTALS:

.1 Project Record Sheet: Submit to the Consultant two (2) copies of the project record sheet identifying the project title and address, Owner, Consultant, and Architectural Woodwork Subcontractor. Indicate also materials and finishes used for architectural woodwork and whether shop finished, or site finished and by whom. Include type and source of all cabinet hardware and any special items used under architectural woodwork.

.2 Submit in accordance with Section 01 78 00 – Operations and Maintenance Manuals.

1.6 QUALITY ASSURANCE

.1 Architectural Woodwork Standards (AWS) and Errata shall be used to establish the minimum level of quality for this project.

.2 Execute the work of this Section by a member of AWMAC with five years' experience in work of comparable complexity and scope.

.3 Any reference to Custom or Premium grade in this specification shall be as defined in the AWS.

.4 Any item not given a specific quality grade shall be Custom grade as defined in the AWS.

.5 A copy of the AWS shall be made readily available for reference purposes on the job site.

.6 References in this specification to part and item numbers mean those parts and items contained within the AWS.

.7 Perform the Work in accordance with the definition of 'Good Workmanship' as defined in the AWS.

.8 Remove and replace finish carpentry Work which does not conform to the AWS.

.9 Guarantee and Inspection Service (GIS)

.1 Architectural woodwork shall be manufactured and/or installed to the current AWMAC Architectural Woodwork Standards and shall be subject to an inspection at the factory and/or site by an appointed AWMAC Certified Inspector. Inspection costs shall be included in the tender price for this project. (Contact your local AWMAC Chapter for details of inspection costs). Shop drawings shall be submitted to the AWMAC Chapter office for review before work commences. Work that does not meet the AWMAC Architectural Woodwork Standards, as specified, shall be replaced, reworked and/or refinished by the architectural woodwork contractor, to the approval of AWMAC, at no additional cost to the owner.

.2 If the woodwork contractor is an AWMAC Manufacturer member in good standing, a two (2) year AWMAC Guarantee Certificate will be issued. The AWMAC Guarantee shall cover replacing, reworking and/or refinishing deficient architectural woodwork due to faulty workmanship or defective materials supplied and/or installed by the woodwork contractor, which may appear during a two (2) year period following the date of issuance.

.3 If the woodwork contractor is not an AWMAC Manufacturer member they shall provide the owner with a two (2) year maintenance bond, in lieu of the AWMAC Guarantee Certificate, to the full value of the architectural woodwork contract.

.4 For more information about AWMAC and the GIS Program visit the AWMAC website at www.awmac.com and contact the Alberta AWMAC Chapter office

.10 Materials and installation shall be in metric measurements.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle materials in accordance with the AWS. Control the temperature and humidity in accordance with AWS recommendations, before, during, and after delivery, during storage, and during and after installation as required.

.2 Provide protective coverings of suitable material for plastic laminate items, taking special precautions to protect corners.

.3 Do not permit delivery of millwork to the site until the area is sufficiently dry so that woodwork shall not be damaged by excessive changes in ambient humidity

1.8 SITE CONDITIONS

.1 Comply with the AWS requirements for care and storage for optimum temperature and humidity conditions. Maintain a minimum 430 lx (40 f.c.) illumination on surfaces and areas where work is being installed.

.2 Where work is indicated to be fitted to other construction, check dimensions of other construction by field measurement before fabrication; show recorded field measurements on final Shop Drawings. Coordinate fabrication schedule with construction schedule and progress to avoid delay of Work.

.3 Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication without field measurements.

Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.10 WARRANTY

.1 Provide 2 year AWMAC GIS Guarantee or Maintenance Bond.

Part 2 Products

2.1 MATERIALS

.1 Use clean stock only and comply with AWS for quality grades specified.

.2 Panel Materials: Provide panel materials meeting requirements for moisture content and grades in accordance with AWS requirements and as specified below. Panel products must be manufactured with no added urea-formaldehyde.

.3 Softwood Plywood: Meeting CSA O121 or CSA O151, cross-banded, sanded G2S, thickness as indicated.

.4 Poplar plywood: to CSA O153, utility interior moisture resistant type.

.5 Particleboard: to ANSI A208.1, Grade M-2 or better, minimum 720 kg/m3 density and Grade M-3, minimum 750 kg/m3 particleboard for countertops and shelves; clearly mark panels with grade mark in visible location; extruded particleboard having loose cores with voids will not be permitted; having no added urea formaldehyde.

.1 Acceptable Materials:

.1 Vesta Particleboard, Flakeboard.

.2 Purekor Platinum Particleboard, Panel Source International.

.3 Encore SDF Sustainable Particleboard, SierraPine Ltd.

.6 Lumber:

.1 Softwood: to CAN/CSA O141, kiln dried to maximum moisture content of 12%, dressed 4 sides.

.7 High Pressure Decorative Laminate (HPDL): to ANSI/NEMA LD3; Grades and application in accordance with applicable AWS requirements and as follows:

.1 Constructed of multiple layers of phenolic resin-saturated kraft paper in combination with a layer of decorative melamine-saturated paper, all fused together under heat and pressure.

.2 Horizontal General Purpose Grade (HGS): thickness of 1.2 mm ±0.12 mm, used on the following:

.1 Horizontal surfaces, unless specified otherwise.

.3 Vertical General Purpose Grade (VGS): thickness of 0.7 mm ±0.10 mm, used on the following:

.1 Vertical surfaces, unless specified otherwise.

.2 Exposed portions of case bodies, including ends, divisions and bottoms.

.3 Exposed shelves.

.4 Casework Doors: exposed and semi-exposed surfaces.

.5 Drawer Faces: exposed and semi-exposed surfaces.

.4 Liner Grade (CLS): thickness of 0.5 mm ±0.10 mm, used on the following:

.1 Semi-exposed shelves.

.2 Interior portions of case bodies.

.3 All surfaces of drawer boxes.

.5 Laminate backer grade (BKL): thickness of 0.5 mm ±0.10 mm, used on the following:

.1 Concealed surface of casework backs.

.2 Concealed surfaces, unless specified otherwise.

.6 Acceptable Materials:

.1 Arborite

.2 Formica

.3 Lamin-Art

.4 Nevamar

.5 Pionite

.6 Wilsonart

.8 Low Pressure Decorative Laminate: to ANSI/NEMA LD3, in accordance with applicable AWS requirements, and as follows:

.1 Melamine impregnated papers thermally fused under pressure.

.2 Thickness: 0.5 mm minimum.

.3 Wear Resistance: 400 cycles minimum.

.4 Colours: as indicated on Drawings.

.9 Stainless steel sheet: ASTM A480, Type 304 alloy minimum 1.6 mm minimum.

.10 Edging:

.1 All edges of door and drawer panels shall be finished the same as face and back (6 sides finished).

.2 Edge type shall conform to AWS requirements.

.3 High Pressure Decorative Laminate Edging:

.1 Horizontal General Purpose Grade (HGS): thickness of 1.2 mm ±0.12 mm, colour and finish to match surface finish.

.11 Adhesive:

.1 Decorative laminate: polyvinyl acetate or aliphatic resin in accordance with manufacturer’s recommendation for curing under pressure for bonding to wood cores, water resistant type.

.2 Edge banding: Thermoplastic hot melt, synthetic resin suitable for applying thin veneer wood edge banding and film overlays.

.12 Sealant: in accordance with Section 07 92 00 – Sealants

2.2 CABINET WORK

.1 Work shall conform to applicable AWS requirements.

.2 HPDL edge banding shall be applied to all four edges.

.3 Door and Drawer Bumpers: Self-adhesive type approximately 6 mm diameter clear silicone bumpers for all cabinet work doors and drawer faces, two per door and drawer, placed at door top and bottom and drawer top.

2.3 CABINET FABRICATION

.1 General

.1 Flush overlay cabinet doors and drawer fronts as detailed.

.2 Fabricate gables and edges meeting walls oversize to allow for scribing to fit on site.

.3 Use non-telegraphing grain plywood when laminate is the specified finish.

.4 Assemble Work with flush butt hairline corners and joints. Cut-outs for services to be done on site during installation. No hairline cracks will be allowed in the face area of cabinet work modules unless approved in writing by Consultant.

.5 Carefully fit, cope or mitre and well glue-up Joints. There shall be no end wood visible on finished surfaces.

.6 Set nail heads in finished surfaces. Countersink screws and bolts, except those detailed to be exposed, and fill holes with edge grain wood plugs to match colour and grain.

.7 Ensure adjacent part of continuous work match in colour and pattern.

.2 Construction

.1 Minimum core thicknesses as follows:

.1 Drawer bottoms, particleboard, 12 mm;

.2 Drawer sides and backs, particleboard, 12 mm;

.3 Drawer fronts, particleboard, 19 mm;

.4 Doors, plywood, 19 mm;

.5 Lower case backs against walls, particleboard, 10 mm;

.6 Upper case backs against walls, particleboard, 10 mm;

.7 Shelves, fixed and adjustable, plywood, 19 mm;

.8 Counter top cores, Plywood with non-telegraphing grain, 19 mm with 38 mm edge, for wet areas, use marine grade plywood and ensure that all cut-outs are sealed prior to installation of sinks, primer is not considered to be an appropriate sealer;

.9 Backsplashes at all locations: Poplar Veneer Plywood, 19 mm; use marine grade plywood at wet areas,

.10 All other work Poplar Veneer Plywood, 19 mm.

.2 Glue, dowel, mortise, lock joint or dado all cabinet work and cabinet work. Do not use staples. Nailing and screws are acceptable. Do not surface nail or screw through countertops.

.3 Blocking, framing, web frames to be solid lumber.

.4 Cut and adapt all Work to receive hardware.

.1 Drill and prepare end gables for insert type shelf standards on gables.

.2 Install all finishing hardware and fittings in shop.

.3 Fittings which may be susceptible to damage during shipping and installation may be installed after millwork installed on site.

2.4 CABINET HARDWARE

.1 Provide the following cabinet hardware, in quantity required, complete with all screws, bolts, washers for complete installation.

.2 Non-Exposed Fasteners: fabricators choice consistent with quality level specified.

.3 Exposed Fasteners: Architectural appearance, material, finish and fastener tool type as selected by Consultant; coordinate sample submittals before ordering materials.

.4 Draw Bolt Fasteners: Mitre butt joint fastener, adjustable and requiring no special tools for installation, galvanized.

.1 Acceptable Materials:

.1 K&V 516 by Knape & Vogt Canada.

.2 BP5162G by Richelieu

.5 Spacers: Rigid PVC to size and profile indicated.

.6 Access Panel Connectors

.1 Acceptable Materials:

.1 Richelieu Type JCB-A0101C complete with Tee-Nut 261.12.

.7 Grommets for electrical cords through counter tops, as indicated on finish schedule.

.8 Pulls: Typical drawers and doors as indicated on finish schedule.

.9 Drawer Slides: Following list of drawer slides is provided to indicate general conformance requirements only; notify the Consultant where drawer width, height or intended use differs from that indicated in the general description and the requirements of the manufacturer:

.1 Light duty drawer slides: 34 kg capacity, ¾ extension and soft closers:

.1 Acceptable materials:

.1 Accuride 2132

.2 Dynaslide 3611

.3 Hettich Canada LP KA3432

.4 Knape and Vogt 8350

.2 Medium duty drawer slides and high height drawers (≥150 mm, ≤305 mm): 41 kg capacity, full extension and soft closers:

.1 Acceptable materials:

.1 Accuride 3834

.2 Hettich Canada LP KA5632

.3 Knape & Vogt 8400

.3 Heavy duty drawer slides: 68 kg capacity, full extension and soft closers:

.1 Acceptable materials:

.1 Accuride 4032

.2 Hettich Canada LP KA555

.3 Knape and Vogt 8500

.10 Hinges:

.1 Oversize or High Use Cabinet Doors: Exposed knuckle pivot hinge with 5 mm axle and cover caps; fully adjustable for overlay and height; opening angle of 180°; self-closing feature; nickel plated zinc die cast construction; gable mounting, and soft closers, size and profile to suit cabinet construction:

.1 Acceptable Materials:

.1 Häfele America Co., Aximat SM Series

.2 Hettich Canada LP, Selekta Pro 2000 Series

.3 Richelieu MB 8000 Series

.11 Locks:

.1 Typical lockable doors and drawers: Nickel finished, master keyed, keyed alike in groups, cam lock with plate, adjust keying group to suit requirements:

.1 Acceptable Materials:

.1 Richelieu

.2 CompX National

.3 Trimline

.12 Door Latches:

.1 Standard Doors: Elbow Latches for inactive leaves of pairs of doors to be locked, standard duty, zinc finish.

.1 Basis-of-Design Materials: Richelieu 36752G

.2 Magnetic Catch:

.1 Basis-of-Design Materials: Richelieu BP504510

.3 Elbow Latch:

.1 Basis-of-Design Materials: Richelieu 36752G

.4 Roller latches for closet doors, heavy duty, double roller type, zinc finish:

.1 Basis-of-Design Materials: Richelieu 6032G

.5 Gate Latch: Aluminum finish, secret gate latch:

.1 Acceptable Materials:

.1 Knape & Vogt 989

.2 Rockwood 600

.6 Touch Latch: Non-metallic:

.1 Basis-of-Design Materials: Amerock Tutch-Latch

.13 Shelf Rests:

.1 Stainless steel pin rests: 7 mm Ø socket collar inserts for steel pin shelf supports, drill holes in cabinet work to accept collar, chrome or nickel finish:

.1 Acceptable Materials:

.1 Knape & Vogt Canada, Series 331/325 grommet

.2 Richelieu 5829-180/2292-180

.14 Other Hardware as indicated on Finish Schedule.

2.5 FACTORY FINISHING – CABINET WORK

.1 Cabinet work for High Pressure Decorative Laminate Finish:

.1 AWS Quality Grade Premium.

.2 Construction: Cabinet work shall conform to applicable sections of the AWS.

.3 Exposed Parts and interior of cabinet doors: High pressure decorative laminate, plywood with non-telegraphing grain as indicated.

.4 Semi-Exposed Parts: Low pressure decorative laminate, plywood with non-telegraphing grain as specified above.

.5 Concealed parts: Low pressure decorative laminate backer to balance face materials.

.2 Laminate and Stainless Countertops and Backsplashes

.1 Countertops shall be self edge type to applicable AWS requirements.

.2 Backsplash shall conform to Section 6 of the AWS.

.3 Custom counter shall be seamless.

Part 3 Execution

3.1 JOB CONDITIONS

.1 Job Conditions for installation of architectural woodwork shall be in accordance with applicable NAAWS requirements.

3.2 INSPECTION

.1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.3 PREPARATION

.1 Obtain measurements from site.

.2 Check access to ensure large pieces of work can be safely handled to their place of final installation.

.3 Protect finished surfaces and materials of other trades from damage.

.4 Ensure services and roughing-in which affect or are connected to or through this work are complete and acceptable.

.5 Back prime cabinet work immediately after delivery to site.

3.4 INSTALLATION

.1 Install work to applicable AWS and Quality Assurance requirements.

.2 Install cabinet work in its indicated locations, plumb, level, and true.

.3 Anchor to floor, walls or ceiling using fastening devices and hardware consistent with the building materials encountered. Do not use wood plugs. Do not use plastic plugs for ceilings or walls. Provide wall strapping as required.

.4 Anchor cabinet work and millwork to building structure. Shim level and set square in relation to adjoining surfaces. Scribe to adjacent Work. Provide allowance for finish flooring installation to base.

.5 Cabinet work:

.1 Fasten to framing using zinc-coated bolts, countersunk and plugged with matching wood plugs.

.2 Set cabinetwork in place, on base, anchoring securely to building structure and to adjoining cabinetwork. Use approved connector type fasteners between items of cabinetwork to hold adjoining pieces tightly together.

.3 Scribe to smooth snug fit with adjoining surfaces and materials to align work. Mitre corners.

.4 Perform cutting, fitting, repairing in woodwork as required by other trades where their work is connected to or part of this work.

.5 Cut out openings for mechanical, electrical, and communications fittings and fixtures. Coordinate and cooperate in the connection and installation of mechanical, electrical, and communications work.

.6 Apply sealant between countertops and adjoining walls and cabinetwork. Seal edges of cut-out core material before fixtures installed.

.7 Install finishing hardware shipped loose.

.6 Supply and install hardware required for the completion of architectural woodwork, including, without limitations, adjustable shelf supports and cabinet hinges, catches, pulls, drawer accessories, bumpers, drawer slides and closet hanger bars, and similar items. Install millwork hardware in the shop wherever possible. Install millwork hardware secure, plumb, level, true to line, and in accordance with the hardware manufacturers' printed instructions. Cut and fit to millwork for proper installation and operation. Provide smoothly operating units free from binding. Clean and adjust hardware for proper operation.

3.5 ADJUSTING

.1 During and after installation adjust all hardware and operating parts as necessary to ensure smooth and proper operation.

3.6 CLEANING

.1 Clean all cabinet, countertops, shelves and fixtures.

.2 Repair any marks, scratches or marring.

.3 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section includes through penetration firestopping and smokeseal systems for penetrations through the following fire resistance rated assemblies, including both empty openings and openings containing penetrating items:

.1 Floors.

.2 Wall and partitions.

.3 Smoke barriers.

.4 Construction enclosing compartmentalized areas.

.2 This Section includes fire resistive joint systems for the following:

.1 Floor-to-floor joints.

.2 Floor-to-wall joints.

.3 Head-of-wall joints.

.4 Wall-to-wall joints.

.5 Joints between perimeter edge of fire resistance rated floor assemblies and back of curtainwall system.

.3 This specification section provides requirements for Rated Systems or systems requiring Engineered Judgements:

.1 Use of materials that have not been tested in a system or that are not capable of obtaining an engineered judgement will not be acceptable for use on this Project.

.2 Materials having only a ULC label will not be acceptable for use on this Project, unless supporting documentation is provided indicating its use in a listed assembly.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 00 – Delegated Design

.2 Section 03 30 00 – Cast-In-Place Concrete

.3 Section 09 21 16 – Gypsum Board Assemblies

.4 Division 23 Mechanical

.5 Division 26 Electrical

1.3 REFERENCES

.1 ASTM International Inc. (ASTM)

.1 ASTM E119-16a, Standard Test Methods for Fire Tests of Building Construction and Materials.

.2 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM E814-13a(2017), Standard Test Method for Fire Tests of Penetration Firestop Systems.

.4 ASTM A1008/A1008M-16, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-

Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

.5 ASTM E1966-15, Standard Test Method for Fire-Resistive Joint Systems.

.6 ASTM E2174-14b, Standard Practice for On-Site Inspection of Installed Fire Stops.

.7 ASTM E2307-15b e1, Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus.

.8 ASTM E2393-10a(2015), Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 National Fire Protection Agency (NFPA)

.1 NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, Current Edition.

.4 Underwriter's Laboratories of Canada (ULC)

.1 ULC Guide No. 40 U19-1998, Firestop Systems.

.2 CAN/ULC S101-14, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.3 CAN/ULC S102-11, Standard Method of Tests for Surface Burning Characteristics of Building Materials and Assemblies.

.4 CAN4 S114-05, Standard Method of Test for Determination of Non-Combustibility in Building Materials.

.5 CAN/ULC-S115-11, Standard Method of Fire Tests of Firestop Systems.

.6 CAN/ULC S702-14, Standard for Thermal Insulation Mineral Fibre for Buildings, Includes Amendment 1(January 2012).

.7 ULC S702.2-15, Mineral Fibre Thermal Insulation for Buildings, Part 2: Application Guidelines.

.8 List of Equipment and Materials.

.5 Underwriters Laboratories Inc. (UL)

.1 ANSI/UL 1479-15, Standard for Fire Test of Through-Penetration Firestops.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant in accordance with Section 01 31 19 – Project Meetings to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

1.5 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.1 Not later than 30 working days following Award of Contract, submit a schedule listing surfaces or components to which firestopping and smokeseals is to be applied, and indicating the firestopping and smokeseals system and materials required and detailing installation.

.2 Where possible determine thickness to be applied from tests of assemblies identical to the assembly to be protected, conducted in accordance with ULC S-101, ASTM E119, ULI 1479, NFPA 251, and ASTM E814.

.3 Determine system from available engineering studies, or correspondence with the labelling agency indicating the effect of the differences on the fire separation of the assembly. Confirm acceptance of system by authorities having jurisdiction in writing.

.4 Where the assembly includes conditions that do not correspond to those included in any previously tested assembly and for which no relevant engineering information is available use the same system and material as would be required for a tested assembly with similar conditions.

.2 Submit product data in accordance with Section 01 33 00 – Submittals:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with WHMIS acceptable to Labour Canada, and Health and Welfare Canada.

.3 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.

.1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

.4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company or person specializing in fire stopping installations and approved by manufacturer with 5 years documented experience.

.2 Use materials and methods of determining required thickness of application that have the full acceptance of authority having jurisdiction.

.3 Use materials tested to CAN/ULC-S115. Assemblies containing the materials shall be in accordance with assemblies tested and approved by agencies acceptable to authority having jurisdiction.

.4 Source Responsibility: Obtain through penetration firestop and joint systems, for each kind of penetration and construction condition indicated, from a single source of installation responsibility.

.5 Delegated Design Professional: Use a professional engineer, registered in the province of the Work and familiar with installations of similar scope and complexity to design firestopping and smokeseals.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, and ULC markings.

.2 Storage and Protection:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.3 Use stock before its expiration date.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.9 SITE CONDITIONS

.1 Install firestopping and smokeseals materials only when the areas in which they are scheduled are closed-in and protected from dampness.

.2 Environmental Limitations: Install firestopping and smokeseals systems when ambient or substrate temperatures are within temperature and moisture limits permitted by firestopping and smokeseals system manufacturers or when substrates are not wet due to rain, frost, condensation, or other causes.

.3 Ventilate firestopping and smokeseals systems in accordance with manufacturer's written instructions by natural means or forced air circulation where natural means are not adequate.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

- .1 3M Canada Inc.
- .2 A/D Fire Protection Systems Inc.
- .3 EZ-Path Fire Rated Pathways
- .4 Firestop Systems Inc.
- .5 Hilti Canada Ltd.
- .6 Johns Manville Fire Protection Systems
- .7 Nuco Self Seal Firestopping Products.
- .8 Passive Fire Protection Partners Firestop Systems Inc.
- .9 Roxtec, Preformed Fire Stopping Systems
- .10 Specified Technologies Inc.
- .11 Tremco Ltd.

2.2 PERFORMANCE/DESIGN CRITERIA

.1 Delegated Design Requirements: Design firestopping and smokeseals required by the Contract Documents to withstand fire ratings indicated and in accordance with requirements of the Building Code, and as described in Section 01 35 00.

.2 Performance Requirements: Manufacturer shall design proprietary assemblies to withstand the listed ratings in accordance with the Building Code, Underwriters Laboratories Canada, and authorities having jurisdiction, and as follows:

- .1 Provide through penetration firestop and joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire resistance rating of assembly penetrated:
  - .1 Fire resistance rated load bearing walls, including partitions, with fire protection rated openings.
  - .2 Fire resistance rated non-load bearing walls, including partitions, with fire protection rated openings.
  - .3 Fire resistance rated floor assemblies.
- .2 F-Rated Systems: Provide through penetration firestop systems with F-ratings indicated, as determined by ULC S115 or ASTM E814, but not less than that equalling or exceeding fire resistance rating of constructions penetrated.
- .3 T-Rated Systems: For the following conditions, provide through penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per by ULC S115 or ASTM E814, where systems protect penetrating items exposed to potential contact with adjacent materials:
  - .1 Penetrations located outside wall cavities.
  - .2 Penetrations located outside fire resistive shaft enclosures.
  - .3 Penetrations located in construction containing fire protection rated openings.

.4 Penetrating items larger than 100 mm diameter nominal pipe or 100 cm^2 in overall cross sectional area.

.4 Firestopping and Smokeseals Systems Exposed To View: Systems 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, and as follows:

.1 Provide moisture resistant through penetration firestop systems for piping penetrations for plumbing and wet pipe sprinkler systems.

.2 Provide firestopping and smokeseals systems capable of supporting floor loads involved either by installing floor plates or by other means for floor penetrations with annular spaces exceeding 100 mm in width and exposed to possible loading and traffic.

.3 Provide firestopping and smokeseals systems not requiring removal of insulation for penetrations involving insulated piping.

.4 Provide products with flame spread ratings of less than 25 and smoke developed ratings of less than 50 for firestopping and smokeseals and joint systems exposed to view.

.5 Fire Resistance of Joint Systems: Assembly ratings and movement capabilities indicated, but with assembly ratings not less than that equalling or exceeding fire resistance rating of constructions in which joints are located.

2.3 MATERIALS: FIRESTOPPING AND SMOKESEALS, GENERAL

.1 Compatibility: Provide firestopping and smokeseals systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating firestopping and smokeseals systems, under conditions of service and application, as demonstrated by firestopping and smokeseals system manufacturer based on testing and field experience, and as follows:

.1 Service penetration assemblies: certified by ULC in accordance with ULC S115 and listed in ULC Guide No. 40 U19.

.2 Service penetration firestopping and smokeseals components: certified by ULC in accordance with ULC S115 and listed in ULC Guide No. 40 U19.13, under the Label Service of ULC.

.3 Fire resistance rating of installed firestopping and smokeseals assembly not less than the fire resistance rating of surrounding floor and wall assembly.

.4 Firestopping and Smokeseals at openings intended for ease of re-entry such as cables: elastomeric seal; do not use cementitious or rigid seal at such locations.

.5 Firestopping and Smokeseals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal; do not use a cementitious or rigid seal at such locations. Exemption to fire dampers.

.2 Accessories: Provide components for each firestopping and smokeseals systems that are needed to install fill materials. Use only components specified by firestopping and smokeseals system manufacturer and approved by the qualified

testing and inspecting agency for firestopping and smokeseals systems indicated. Accessories include, but are not limited to, the following items:

.1 Permanent forming, damming and backing materials, including the following:

.1 Slag or rock wool fibre insulation.

.2 Sealants used in combination with other forming, damming or backing materials to prevent leakage of fill materials in liquid state.

.3 Fire-rated form board.

.4 Fillers for sealants.

.2 Temporary forming materials.

.3 Substrate primers.

.4 Collars.

.5 Steel sleeves.

.6 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.7 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.8 Metal fire stop: Commercial galvanized steel, to ASTM A1008/A1008M, zinc coating 260 g/m^2, minimum metal core thickness 0.912 mm.

.9 Steel Deck Moulded Flute Inserts: One piece moulded mineral fibre flute inserts, sized for steel deck profiles, for placement at top of fire rated wall assemblies:

.1 Acceptable material: Hilti CP777 Speed Plugs.

.10 Labels: Peel-and-stick labels printed with the following information:

.1 ATTENTION: FIRE RATED ASSEMBLY. DO NOT MODIFY

.2 Name of firestopping manufacturer

.3 Names of products used

.4 Hour Rating of Assembly

.5 Manufacturers standard detail number, or Engineered Judgement identifier; ULC or $_{c}UL_{us}$ Number

.6 Date of installation

.7 Name of installing Subcontractor

.8 Contact telephone number for repair or replacement of firestopping materials.

2.4 FILL MATERIALS

.1 General:

.1 Provide firestopping and smokeseals systems containing the types of fill materials indicated in the Firestopping and Smokseals System Schedule below by reference to the types of materials described in this Article. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.

.2 Firestopping and smoke seal systems shall be tested in accordance with ULC S115, and be comprised of asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and

gases, and not to exceed opening sizes for which they are intended for the ratings as indicated on drawings.

.2 Cast-in-Place Firestopping and Smokeseals Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

.3 Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

.4 Firestopping and Smokeseals Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrating item.

.5 Cable Penetration Devices: Premanufactured intumescent blocks, consisting of a system of inserts and adjustable cores; or premanufactured fire rated cable pathway systems, the following products are acceptable:

.1 EZ-Path Fire Rated Pathway, Specified Technologies Inc.

.2 CP 653 Speed Sleeve, Hilti

.3 Intumescent Blocks CFS-BL, Hilti

.4 Intumescent Blocks, Roxtec.

.6 Intumescent Composite Sheets: Rigid panels consisting of aluminum foil faced elastomeric sheet bonded to galvanized steel sheet.

.7 Intumescent Putties: Non-hardening dielectric, water resistant putties containing no solvents, inorganic fibres, or silicone compounds.

.8 Intumescent Spray Foam: Expanding spray-in-place intumescent foam sealant.

.9 Intumescent Wrap Strips: Single component intumescent elastomeric sheets with aluminum foil on one side.

.10 Mortars: Pre-packaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a non-shrinking, homogeneous mortar.

.11 Pillows/Bags: Reusable, heat expanding pillows/bags consisting of glass fibre cloth cases filled with a combination of mineral fibre, water insoluble expansion agents and fire retardant additives.

.12 Silicone Foams: Multi-component, silicone based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

.13 Silicone Sealants: Moisture curing, single component, silicone based, neutral curing elastomeric sealants of grade indicated below:

.1 Grade for Horizontal Surfaces: Pourable (self levelling) formulation for openings in floors and other horizontal surfaces.

.2 Grade for Vertical Surfaces: non-sag formulation for openings in vertical and other surfaces.

2.5 MIXING

.1 For those products requiring mixing before application, comply with firestopping and smokeseals system 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.

2.6 ACCESSORIES

.1 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.2 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.3 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.4 Metal fire stop: Commercial galvanized steel, to ASTM A1008/A1008M, zinc coating 260 g/m^2, minimum metal core thickness 0.95 mm (20 ga.).

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 EXAMINATION

.1 Examine surfaces, components, materials to receive firestopping and smokeseals material; report any conditions which would detrimentally affect the application of the material or the proper firestopping and smokeseals of the system.

.2 Commence Work when conditions of surfaces and the working conditions are suitable.

.3 Where penetration sealants or caulking are required, ensure all service lines are in place, tested and approved.

.4 Verify all proper blocking, framing (using non-combustible materials) are properly installed and prepared to receive firestopping and smokeseals. Notify Consultant in writing of any deficiencies affecting the proper performance of the firestopping and smokeseals, do not proceed until deficiencies are corrected.

3.3 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.

.1 Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Prime surfaces as required.

.5 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.4 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.2 Apply firestopping and smokeseals materials/systems to maintain the fire separations in the project as indicated on drawings.

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.5 Tool or trowel exposed surfaces to neat finish.

.6 Remove excess compound promptly as work progresses and upon completion.

3.5 FIELD QUALITY CONTROL

.1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.1 Cut tests may be made at random by the Owner. Frequency of cut tests shall be determined by the Consultant, but will not be more than 1% of total length of firestopping and smokeseals.

.2 Make all necessary repairs and correct all deficiencies noted after completion of cut tests.

.2 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, twice during progress of Work at 25% and 60% complete.

3.6 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

.1 Design and provide through penetration firestopping and smokeseals as follows for:

.1 Systems with No Penetrating Items: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Silicone sealant.

.3 Intumescent putty.

.4 Intumescent foam blocks or boards.

.5 Intumescent spray foam.

.2 Systems for Metallic Pipes, Conduit, or Tubing: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Silicone sealant.

.3 Intumescent putty.

.4 Intumescent foam blocks or boards.

.5 Intumescent spray foam.

.3 Systems for Non-metallic Pipe, Conduit, or Tubing: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Silicone sealant.

.3 Intumescent putty.

.4 Intumescent wrap strips.

.5 Firestopping and Smokeseals device.

.6 Intumescent spray foam.

.4 Re-enterable and Cable Managed Systems for Electrical, and Data and Communications Cables:

.1 Prefabricated Firestop Sleeve CP653 (Hilti)

.2 Preformed Intumescent Blocks CFS-BL (Hilti)

.3 Preformed Intumescent Blocks (Roxtec)

.4 Prefabricated Cable Pathways (EZ-Path)

.5 Systems for Electrical, and Data and Communications Cables: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Silicone sealant.

.3 Intumescent putty.

.4 Silicone foam.

.5 Prefabricated Firestop Sleeve CP 653 (Hilti).

.6 Preformed Intumescent Blocks CFS-BL (Hilti)

.7 Preformed Intumescent Blocks (Roxtec).

.8 Prefabricated Cable Pathways (EZ-Path).

.9 Intumescent foam blocks or boards.

.10 Intumescent spray foam.

.6 Systems for Cable Trays: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Intumescent putty.

.3 Silicone foam.

.4 Pillows/bags.

.5 Intumescent foam blocks or boards.

.7 Systems for Insulated Pipes: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Intumescent putty.

.3 Silicone foam.

.4 Intumescent wrap strips.

.5 Intumescent foam blocks or boards.

.6 Intumescent spray foam.

.8 Systems for Miscellaneous Electrical Penetrations: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Intumescent putty.

.3 Intumescent foam blocks or boards.

.4 Intumescent spray foam.

.9 Systems for Miscellaneous Mechanical Penetrations: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Intumescent foam blocks or boards.

.3 Intumescent spray foam.

.10 Systems for Groupings of Penetrations: Select one or more of the following fill materials:

.1 Latex sealant.

.2 Intumescent wrap strips.

.3 Firestopping and Smokeseals device.

.4 Intumescent composite sheet.

.5 Intumescent foam blocks or boards.

.6 Intumescent spray foam.

.2 Design and provide joint firestopping and smokeseals as follows for:

.1 Floor-to-Floor, Fire Resistive Joint System: Provide materials to meet the following criteria:

.1 Assembly Rating: As indicated.

.2 Nominal Joint Width: As indicated.

.3 Movement Capabilities: Compression and extension.

.2 Floor-to-Wall, Fire Resistive Joint System: Provide materials to meet the following criteria:

.1 Assembly Rating: As indicated.

.2 Nominal Joint Width: As indicated.

.3 Movement Capabilities: To be confirmed, compression, extension, or horizontal shear.

.3 Head-of-Wall, Fire Resistive Joint System: Provide materials to meet the following criteria:

.1 Assembly Rating: As indicated.

.2 Nominal Joint Width: As indicated.

.3 Movement Capabilities: Compression and extension.

.4 Wall-to-Wall, Fire Resistive Joint System: Provide materials to meet the following criteria:

.1 Assembly Rating: As indicated.

.2 Nominal Joint Width: As indicated.

.3 Movement Capabilities: Compression and extension.

.3 Design and provide perimeter fire containment firestopping and smokeseals as follows for:

.1 Perimeter Fire Containment System: Provide materials to meet the following criteria:

.1 Integrity Rating: As indicated.

.2 Insulation Rating: As Indicated.

.3 Linear Opening Width: As indicated.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 30 00 – Cast-In-Place Concrete

.2 Section 06 40 00 – Architectural Woodwork

.3 Section 09 21 16 – Gypsum Board Assemblies

.4 Section 09 65 00 – Resilient Flooring

.5 Division 23 – Mechanical

.6 Other technical sections as required

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C794-18, Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

.2 ASTM C834-17, Standard Specification for Latex Sealants

.3 ASTM C919-18, Standard Practice for Use of Sealants in Acoustical Applications.

.4 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.

.5 ASTM C1193-16, Standard Guide for Use of Joint Sealants.

.6 ASTM C1330-18, Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants

.7 ASTM C1521-13, Standard Method of Fire Tests of Firestop Systems

.8 ASTM D2240-15e1, Standard Test Methods for Rubber Property, Durometer Hardness.

.2 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 Sealant, Waterproofing, and Restoration Institute (SWRI) publication – Sealants: The Professionals' Guide 2013

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.7 ULC

.1 CAN/ULC S115-11, Standard Method of Fire Tests of Firestop Systems

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals.

.1 Submit manufacturer's printed product literature, specifications and data sheet. Indicate the following:

.1 Caulking compound

.2 Primers

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.4 Manufacturers Sample Warranty

.2 Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for sealants. Indicate VOC content.

.3 Submit manufacturer's installation instructions for each product used.

.4 When required by Consultant, submit test certificates from an approved Canadian materials testing laboratory indicating that sealants meet the requirements of the standards specified, and that the tests have been conducted in accordance with ASTM D2240.

.2 Submit samples in accordance with Section 01 33 00 – Submittals Procedures.

.1 Provide colour samples of the actual sealants for approval; painted or printed colour charts are not acceptable.

1.4 QUALITY ASSURANCE

.1 Caulking shall be performed by a caulking contractor with minimum 3 years successful experience in Work of similar size and complexity.

.2 Before performing Work of this Section, submit the names of proposed materials. If specified using Standards, indicate Qualification Number.

.3 Compatibility: Ensure sealants are compatible with adjacent materials and are approved by manufacture for use with adjacent materials.

.4 Mock-Ups

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Before performing caulking work do sample applications of each type of sealant for approval. Site locations for sample applications shall be designated by Consultant. Approved samples shall form standard for this project and no work of inferior quality will be allowed. Start no final work until approval of samples is given by the Consultant.

1.5 PERFORMANCE REQUIREMENTS

.1 Sealant system shall satisfy following requirements for duration of warranty period:

.1 Waterproof, flexible, and thermally compatible with substrate under applicable service conditions.

.2 Provide a weather-tight seal that does not allow moisture penetration.

.3 Shall not debond, crack, or craze.

.4 Shall not leak.

.2 Reference to products does not relieve manufacturer of responsibility to comply fully with specified criteria.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver containers labelled and sealed, complete with written application and maintenance instructions.

.3 Store materials in a dry heated enclosure in accordance with manufacturer's instructions.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.5 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.6 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

.7 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.8 Fold up metal banding, flatten, and place in designated area for recycling.

1.8 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

.2 Substrate must be clean, dry, and frost free.

1.9 WARRANTY

.1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with General Conditions, but for three (3) years.

.2 Provide Warranty for sealants to include in maintenance manuals as specified in Section 01 78 00 – Operations and Maintenance Data Manuals.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers: Subject to compliance with requirements in this Section and as recommended by the manufacturer, manufacturers offering products that may be incorporated into the Work include the following:

.1 BASF, Sonneborn.

.2 Chemtron Manufacturing Ltd.

.3 Dow Corning Canada Inc.

.4 GE Silicones Limited.

.5 Sika Chemical of Canada Ltd.

.6 Tremco Ltd.

2.2 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.3 Unless otherwise specified, VOC content limits of sealants shall be in accordance with SCAQMD Rule 1168 and as follows:

.1 Architectural Materials:

.1 Sealants: VOC content limit 250 g/L.

.2 Sealant Primers for Non-Porous Surfaces: VOC content limit 250 g/L.

.3 Sealant Primers for Porous Surfaces: VOC content limit 775 g/L.

.2 All Other Applications:

.1 Sealants: VOC content limit 420 g/L.

.2 Sealant Primers: VOC content limit 750 g/L.

2.3 SEALANT MATERIAL DESIGNATIONS

.1 Type S-1: Acrylic Latex One Part, Shore A Hardness 20, to ASTM C834.

.1 Acceptable materials:

.1 Latacalk, Chemtron.

.2 Sonolac, BASF Sonneborn.

.3 Latex 100, Tremco.

.2 Type S-2: Silicone Sealant; mould and mildew resistant.

.1 To ASTM C920; type S; grade NS; class 50; use NT, G, and A.

.2 Acceptable materials:

.1 Chemtron Multiseal

.2 GE SCS2000

.3 795 Silicone, Dow Corning.

.4 Spectrem 2 Silicone, Tremco Inc.

.3 Type S-3: Silicone Sealant; general construction and air-seal sealant.

.1 To ASTM C920: type S; grade NS; class 25; use NT, M, G, A, O.

.4 Type S-4: Silicone Sealant; structural glazing.

.1 To ASTM C920: type S; grade NS; class 25; use NT, A, G, O.

.2 Acceptable materials:

.1 995 Silicone, Dow Corning.

.2 Proglaze SSG, Tremco Inc.

.3 SSG4000, General Electric.

.5 Type S-5: Acoustical Sealant; interior, non-skimming, non-hardening, simple component synthetic rubber sealant.

.1 Acceptable materials:

.1 Acoustical Sealant, Tremco

.2 Metaseal, Chemtron.

.6 Type S-6: Multi-component polyurethane sealant; chemical curing, exterior wall sealant.

.1 To ASTM C920: type M; grade NS; class 50; use T, NT, M, A, O.

.2 Acceptable materials:

.1 Dymeric, Tremco.

.2 Sikaflex 2c NS, Sika.

.3 MasterSeal NP2, BASF

.4 Sonolastic NP 2, BASF Sonneborn.

.5 Thioplast 400, Chemtron

.6 830, Isoflex

.7 Type S-7: One-component polyurethane sealant; non-sag, for general construction.

.1 To ASTM C920: type S; grade NS; class 25; use NT, M, A, O.

.2 Acceptable materials:

.1 Dymonic FC, Tremco Inc

.2 Multiflex, Chemtron.

.3 Masterseal NPI, BASF

.4 Sikaflex 1a, Sika.

.5 Mapeflex P1, MAPEI Inc

.6 Pourthane NS, W.R. Meadows Canada

.8 Type S-8: Horizontal joint sealant; two component, self-levelling.

.1 To ASTM C920: type M; grade P; class 25; use T, M, O.

.2 Acceptable materials:

.1 Sikaflex 2c SL, Sika.

.2 Sonolastic SL 2, BASF Sonneborn.

.3 THC-901, Tremco Inc

.9 Type S-9: One part moisture curing, low modulus polyurethane sealant for sealing joints in level and slightly slope surfaces conforming to ASTM C920, type S, grade P, class 50, use T, M, A,O, MC-1-25-B-N.

.1 Acceptable materials:

.1 Sonolastic SL 1, BASF Sonneborn.

.2 Vulkem 45 SSL, Tremco Inc

.10 Type S-10: Control joint sealant: two-component, epoxy-urethane, self-levelling, load bearing saw cut or preformed control joints.

.1 Acceptable materials:

.1 Loadflex, Sika.

.2 Planiseal Rapid Joint 15, MAPEI Inc.

.3 Rezi-Weld Flex with Pourthane NS, WR Meadows

.11 Type S-11: One-component polyurethane sealant; medium-modulus, non-sag, low-VOC, UV stable.

.1 To ASTM C920: type S; grade NS; class 50; use NT, T, M, A, O, I.

.2 Acceptable materials:

.1 Dymonic 100, Tremco Inc.

.2 Multiflex, Chemtron

.3 Vulkem 116, Mameco

2.4 COLOURS

.1 Colours: To match adjacent materials, as selected by Consultant, from manufacturer’s standard colour range.

2.5 SEALANT SELECTION

.1 Where no specified type of sealant is shown or specified, choose one of the sealants specified in this Section appropriate for its location.

.2 Make sealant selections consistent with manufacturer’s recommendations.

.3 Use acrylic sealant Type S-1 only on the interior and only in situations where little or no movement can occur.

.4 Use mould & mildew resistant silicone sealant Type S-2 for non-moving joints in washrooms and kitchens. Do not use on floors.

.5 Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type specified.

.6 Use structural glazing silicone Type S-4 for sealing glass, interior and exterior.

.7 Use acoustical sealant Type S-5 and air seal sealant Type S-3 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.

.8 Use multi-component sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.

.9 Use multi-component sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.

.10 Use polyurethane, semi-self levelling sealant Type S-9 for in expansion joints in sidewalks, plazas, floors and other pedestrian and vehicular horizontal surfaces with slopes up to 6%.

.11 Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.

.12 Use sealant S-11 for sealing exterior holes and penetrations around pipes and other services passing through concrete foundations and requiring greater movement capability.

2.6 ACCESSORIES

.1 Preformed Compressible and Non-Compressible back-up materials that are non-staining, compatible with joint substrate, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on site experience and laboratory testing.

.1 Rod Type Sealant Backings:

.1 ASTM C1330, Type C (closed cell material with a surface skin), Type O (open cell material) or Type B (bi-cellular material with a surface skin).

.2 Use any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated.

.3 Size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

.4 Non-adhering to sealant, to maintain two sided adhesion across joint.

.2 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/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.3 Bond Breaker Tape.

.1 Polyethylene bond breaker tape or other tape recommended by sealant manufacturer which will not bond to sealant.

.2 Preformed Sealants

.1 Preformed Silicone Sealant System: Manufacturer's standard system consisting of pre-cured low modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral curing silicone sealant for bonding extrusions to substrates:

.1 Acceptable materials:

.1 Dow Corning Corporation; 123 Silicone Seal.

.2 GE Silicones; UltraSpan US1100.

.3 Tremco; Spectrem Ez Seal.

.3 Primer: Non-staining type as recommended by sealant manufacturer.

.4 Joint Cleaner: Non-corrosive solvent type recommended by sealant manufacturer for applicable substrate materials.

.5 Bond Breaker: Pressure-sensitive plastic tape that will not bond to sealants.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 INSPECTION

.1 Carefully inspect surfaces, materials to receive sealants and verify they are physically capable of retaining sealant bond.

.2 Verify that fillers and backing provided under other Sections properly installed.

.3 Grind joint surfaces if required to achieve adequate surface preparation.

3.3 SURFACE PREPARATION

.1 Prepare surfaces in accordance with manufacturer’s instructions.

.2 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.3 Maintain workmanship of highest quality in accordance with best trade practice.

.4 Ensure that joint forming materials are compatible with sealant.

.5 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work. Wire brush loose materials and other foreign matter which might impair adhesion of sealant.

.6 Use air stream to blow out dirt and water from crevices.

.7 Ensure joint surfaces are dry and frost free

.8 Prime all porous material (e.g. wood, masonry, concrete, ceramic or paver tile, etc).

.9 Prime other joints when recommended by manufacturer. Use a brush that will reach all parts of the joints. Mask adjoining surfaces with tape prior to priming to prevent staining.

3.4 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.

3.5 BACKUP MATERIAL

.1 Use backer rod as specified, to limit depth of sealant and to act as bond breaker at back of joint.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.3 Where depth of joint does not permit the use of backer rod apply paper masking tape to back of joint to act as bond breaker.

.4 Ensure that no joints are formed which are bonded on adjacent sides where there is any possibility of movement.

3.6 MIXING

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

3.7 APPLICATION

.1 Apply sealant in strict accordance with manufacturer's recommendations.

.2 For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9 mm; for joints larger than 25 mm use a depth of 13 mm

.3 Use pressure gun fitted with suitable nozzle. Use sufficient pressure to fill voids and joints solid.

.4 Form surface of sealant smooth, free from ridges, wrinkles, sags, or air pockets and imbedded impurities. Neatly tool surface to a slight concave appearance.

.5 Tool sealants to achieve air tight joints. Use wet tools as required.

.6 Ensure bead is solid, filling entire space between sides and bedding material, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.

.7 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.

.8 Seal perimeters of hollow metal door frames on both sides.

.9 Seal control joints in gypsum board and stucco, and junctures between interior partitions with exterior walls.

.10 Seal window and door frames around the inside perimeter, so that an airtight seal is obtained, as indicated on drawings.

.11 Seal joints in floors and walls and around service and mechanical and electrical fixture penetrations.

.12 Seal at all locations where dissimilar material meet.

.13 Curing

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.8 CLEAN UP

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

.4 On porous surfaces allow sealant to cure overnight, and remove excess by light wire brushing.

.5 Correct staining and discolouring of adjacent surfaces as directed by Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 92 00 – Sealants

.2 Section 08 14 16 – Flush Wood Doors

.3 Section 08 71 00 – Door Hardware

.4 Section 09 21 16 – Gypsum Board Assemblies

.5 Section 09 91 00 – Painting

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A653/A653M-17, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A780/A780M-09(2015), Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings.

.3 ASTM A879/A879M-12(2017), Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

.4 ASTM A924 / A924M-17a, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.5 ASTM B29-14, Standard Specification for Refined Lead.

.6 ASTM B749-14, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.7 ASTM C553-13, Specification for Mineral Fiber Blanket Insulation for Commercial and Industrial Applications

.8 ASTM C578-18, Specification for Rigid, Cellular Polystyrene Thermal Insulation

.9 ASTM C591-17, Specification for Un-Faced Pre-formed Rigid Cellular Polyisocyanurate Thermal Insulation

.10 ASTM C592-16, Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type)

.11 ASTM C1289-17, Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

.12 ASTM D1622/D1622M-14, Standard Test Method for Apparent Density of Rigid Cellular Plastics.

.13 ASTM D4726-15, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors.

.14 ASTM D6386-16a, Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

.15 ASTM D7396-14, Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.

.16 ASTM E90-09(2016), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

.17 ASTM E413-16, Classification for Rating Sound Insulation

.2 Builders Hardware Manufacturers Association (BHMA)

.1 BHMA A156.16-2013, Auxiliary Hardware.

.3 Canadian Standards Association (CSA Group)

.1 CSA A440H-14, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.2 CSA A440S1-17, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.3 CAN4-S106-M80(R1985), Standard Method for Fire Tests of Window and Glass Block Assemblies

.4 CSA-G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel, Includes Update No. 1 (2014).

.5 CSA W47.1-09(R2014), Certification of companies for fusion welding of steel, Includes Update No. 3 (2011), Update No. 5 (2012), Update No. 6 (2013).

.6 CSA W59-13, Welded Steel Construction (Metal Arc Welding), Includes Update No. 1 (2014), Update No. 3 (2015), Update No. 4 (2015).

.4 Canadian Steel Door Manufacturers' Association (CSDMA)

.1 CSDMA, Guide Specification for Installation and Storage of Hollow Metal Doors and Frames, 2012.

.2 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.

.3 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.

.5 National Fire Protection Association (NFPA)

.1 NFPA (Fire) 80, Standard for Fire Doors and Other Opening Protectives, 2016 Edition.

.2 NFPA (Fire) 252, Fire Tests of Door Assemblies, 2017 Edition.

.6 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113-11, Architectural Coatings.

.2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.7 The Society for Protective Coatings (SSPC)

.1 SSPC-PS 12.01, One Coat Zinc-Rich Painting System.

.2 SSPC-PS Guide 12.00, Guide to Zinc-Rich Coating Systems.

.8 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC S104-15, Standard Method for Fire Tests of Door Assemblies.

.2 CAN/ULC S105-16, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.

.3 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.4 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Product Data:

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

.2 Submit manufacturer's printed product literature, specifications and data sheets for each type of door and frame specified.

.3 Submit test and engineering data, and installation instructions.

.4 Test and Evaluation Reports:

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.

.2 All test reports that reference the NAFS must include, on the first page, a summary of the results including, at minimum:

.1 The product manufacturer.

.2 The type of product.

.3 The model number/series number.

.4 The primary product designation.

.5 The secondary product designation.

.1 Positive design pressure.

.2 Negative design pressure.

.3 Water penetration resistance test pressure.

.4 Canadian air infiltration and exfiltration levels.

.6 The test completion date.

.2 Shop Drawings:

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

.2 Indicate general construction of each type of door and frame, configurations, material, material thickness, jointing methods, mortises, reinforcements, anchors, arrangement of hardware, fire ratings, finish and special features.

.3 Reference door and frame types to Door Schedule. Indicate door numbers where applicable.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for cleaning and maintenance of finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Qualifications

.1 Manufacturer/Fabricator: Use a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.

.2 Installer: Use installers who are experienced with the installation of hollow metal doors and frames of similar complexity and extent to that required for the Project.

.2 Preconstruction Testing: Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled:

.1 List by nationally recognized agency having factory inspection service and construct as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and as follows:

.1 Receive and store materials as recommended by materials manufacturer.

.2 Adequately protect surfaces from damage during moving, handling and storage.

.2 Packaging Waste Management

.1 Separate and recycle waste materials in accordance with Section 01 74 21 –Waste Management and Disposal.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

.1 Perform work in accordance with CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, except as otherwise specified herein.

.2 Steel fire rated doors and frames: Label and list fire rated doors and frames by an organization accredited by the Standards Council of Canada in conformance with CAN4-S104 and CAN4-S105 for ratings indicated. Fire labels must be factory applied by the manufacturer.

.3 Be responsible for securing approval from authorities having jurisdiction for materials, fabrication and installation of fire rated oversized door and frame assemblies

2.2 MATERIALS

.1 Steel:

.1 Doors and Frames: coated steel sheets to ASTM A924/M924; coating designation to ASTM A653/A653M: Commercial Steel (CS), Type B, ZF180; stretcher levelled.

.2 Nominal Base Metal Thickness Requirements:

.1 Frames: refer to frame fabrication requirements specified in this section.

.2 Doors: refer to door fabrication requirements specified in this section.

.3 Hardware Reinforcement for Doors and Frames: Carbon steel, welded in place, prime painted, to the following minimum nominal thicknesses:

Hardware Reinforcement	Door (mm)	Frame (mm)
Mortise Hinge:	3.51	3.51
Mortise or Bored Lock or Deadbolt:	1.98	1.98
Flush or Surface Bolt Front:	1.98	1.98

Hardware Reinforcement	Door (mm)	Frame (mm)
Surface or Concealed Closer:	2.74	2.74
Strike Reinforcements:	1.98	1.98
Hold Open Arm:	1.98	1.98
Electronic Hardware Reinforcements:	1.98	1.98
Pull Plates and Bars:	1.30	1.30
Mortar Box:	--	0.84
Surface Exit Devices:	1.98	1.98
Door Surface Hardware Reinforcements:	1.30	1.30
Frame surface hardware reinforcements:	2.74	2.74
Notes: Provide guard boxes to protect mortised cut-outs from spray applied insulation, fully sealed.		

.3 Door Core Materials

.1 Honeycomb (interior only): Structural small cell 25 mm maximum. kraft paper honeycomb:

.1 Weight: 36.3 kg/ream minimum.

.2 Density: 16.5 kg/m^3 minimum.

.3 Sanded to required thickness.

.2 Polystyrene: Rigid extruded, closed cell insulation, fire retardant treated meeting the requirements of ULC S701, Type 4, minimum thermal resistance RSI 0.8/25 mm thickness.

.3 Polyurethane: rigid, cellular type, board, conforming to ASTM D1622, or foamed-in-place, 29 kilograms per cubic meter density minimum, containing no urea formaldehyde resins.

2.3 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.1 Adhesive: maximum VOC content 50 g/L to SCAQMD Rule 1168.

.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Interlocking Edge Seam Adhesive: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

.1 Touch-up primer: to ASTM A780/A780M and SSPC-PS 12.01.

.1 Maximum VOC limit 50 g/L to GC-03.

2.5 PAINT

.1 Prepare surfaces for field painting to ASTM D6386 and ASTM D7396.

.2 Field paint steel doors and frames in accordance with Section 09 91 00 - Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

.1 Maximum VOC emission level 50 g/L to GS-11 and to SCAQMD Rule 1113.

2.6 ACCESSORIES

.1 Door silencers (bumpers): Grey rubber, to ANSI/BHMA A156.16 Type 6-180; three silencers on strike jambs of single door frames; two silencers on heads of double door frames; screw fastener applied. Stick on bumpers are not acceptable.

.2 Floor anchors: 3.5 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.

.3 Metallic paste filler: to manufacturer's standard.

.4 Fasteners: tamperproof type 304 stainless steel screws with countersunk flat head.

.5 Labels for fire doors and door frame: brass plate, riveted to door and door frame.

.6 Sealant: Section 07 92 00 – Joint Sealants.

.1 Maximum VOC limit 250 g/L to SCAQMD Rule 1168.

2.7 FABRICATION GENERAL

.1 Welded construction: assemble units by welding in accordance with CSA W59 to produce a finished unit square, true and free of distortion. Welding shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau to the requirements of CSA W47.1.

.2 Permit access by an approved inspection and testing company for the purpose of inspecting at random, doors being fabricated for this project.

.3 Make provisions in doors and frames to suit requirements of trade or section providing electrically operated hardware or security devices. Provide removable plates or knock outs for electrical contacts. Provide junction boxes on security door frames as required for door strikes, mag locks and door contacts. Ensure frames arrive on site prepared for wiring.

.4 Fabricate galvanized steel channels to reinforce frames and screens as required for size, and for fire protection rating requirements. Extend reinforcements from floor to structure above. Design top connection to accommodate structural deflection. Conceal reinforcements in frames and screens.

.5 Fabricate all rated doors, frames and screens to fire rating labelling authority standard.

2.8 FRAMES AND SCREENS FABRICATION: GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Accurately form frames to profiles indicated. Construct frames straight and free from twist or warp.

.3 Interior frames: 1.6 mm minimum for single doors; 1.98 mm for frames with opening width in excess of 1220 mm; welded type construction. 50 mm face

standard frame profile, throat and frame width to suit wall construction. Knock-down frames are not allowed.

.4 Blank, drill, reinforce and tap frames to receive mortised, templated hardware, security and electrical devices, using templates provided by finish hardware supplier. Reinforce frames for installation of closers. For transportation, install stiffener plates or two angle spreaders where required to prevent bending of frame and to maintain alignment when setting. Weld reinforcement in place. Remove prior to installation.

.5 Provide removable portion of stop and frame where required for overhead concealed door closers, properly connected to frame, and prepare for attachment of closer prior to shipment.

.6 Protect mortised cutouts with steel guard boxes.

.7 Manufacturer's nameplates on frames and screens are not permitted.

.8 Conceal fastenings except where exposed fastenings are indicated.

.9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

.10 Partition Screens:

.1 Fabricate metal screens to profiles indicated.

.2 Supply jamb and mullion extensions and anchors required to secure screens to structure or framing provided under other Sections. Fabricate anchorage to prevent transfer of load from support framing to the screens when deflection of structure occurs.

.3 Provide concealed reinforcement for screens to receive handrails.

.11 Provide fire labelled frames for those openings requiring fire protection ratings, as scheduled on Drawings.

2.9 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Where frames terminate at finished floor, supply floor plates for anchorage to slab. Check depth of extension of finished floor to structural slab and provide jamb extension anchorage as required. Provide 50 mm minimum adjustment

.3 Locate wall anchors immediately above or below each hinge reinforcement on the hinge jamb, and directly opposite on the strike jamb. Provide three anchors per jamb for frames up to 2300 mm. Add one anchor per jamb for each additional 760 mm or fraction thereof in frame height.

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.10 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Cut frame mitres accurately and weld on inside of frame profile. Fill frame corners, exposed surface depressions and butted joints with air drying paste filler. Sand to a smooth uniform finish. Touch up damaged galvanized finish with zinc rich primer.

.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.

2.11 DOOR FABRICATION GENERAL

.1 Fabricate steel doors rigid, neat in appearance, and free from defects including warp and buckle; 45 mm thickness of types and sizes indicated on drawing, and as follows:

.1 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.

.2 Form edges true and straight with minimum radius suitable for thickness of steel used.

.3 Bevel lock and hinge edges 3 mm in 50 mm; confirm requirement with builder’s hardware or door swing that could dictate a different bevel.

.4 Top and bottom of doors shall be provided with inverted, recessed, nominal 1.60 mm steel end channels, welded to each face sheet at 150 mm O/C.

.5 Provide fire labelled doors for those openings requiring fire protection ratings, as indicated on Drawings.

.6 Fabricate doors with the following clearances:

.1 Clearance between door and frame and between meeting edges of doors swinging in pairs shall not exceed 3 mm

.2 Clearance between the bottom of door and floor shall not exceed 19 mm or as required to accommodate specified hardware

.3 Clearance between bottom of door and a raised non-combustible sill in accordance with NFPA 80

.4 Clearance between bottom of door and nominal surface of combustible floor coverings in accordance with NFPA 80

.2 Fabricate doors with longitudinal edges locked seam and spot welded. Seams: not visible, grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish. Bevel both stiles of single doors 1 in 16.

.3 Interior Doors: Flush, lock seam construction, hollow steel doors fabricated in accordance with CSDMA Manufacturing Specifications for Doors and Frames, and as follows:

.1 Face sheets: Minimum 1.30 mm base steel sheet thickness.

.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet.

.4 Fire Rated Doors: Flush, lock seam construction, hollow steel doors fabricated in accordance with CAN4 S104 and NFPA 80, and as follows:

.1 Face sheets: Minimum nominal 1.60 mm base steel sheet thickness.

.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet.

.3 Equip pairs of fire labelled doors with minimum 2.74 mm steel surface mounted flat bar astragal, welded to door face; plug welded on face and stitch welded to butt edge of door.

.4 Labelled by Underwriters Laboratories of Canada, ITS/Warnock Hersey, or other testing laboratory approved by the authority having jurisdiction.

Part 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 EXAMINATION

.1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Consultant. Commencement of work means acceptance of existing conditions

3.3 INSTALLATION GENERAL

.1 Install fire rated doors and frames in accordance with requirements of NFPA 80.

.2 Install back angle for sill PMMA membrane to terminate on below the threshold in line with the primary air seal.

.3 Install doors, frames and accessories in accordance with reviewed shop drawings, ANSI A250.11, CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames, manufacturer’s data, and as specified in this Section.

.4 Damaged or twisted door and frames, or doors with interior cores or frame telegraphing through, will be rejected.

3.4 FRAME INSTALLATION

.1 Door Frames:

.1 Remove temporary spreaders before installing door frames, leaving exposed surfaces smooth and undamaged.

.2 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 2 mm out of plumb measured on face of frame, maximum twist corner to corner of 3 mm; align horizontal lines in final assembly.

.3 Brace frames rigidly in position until adjacent construction is complete; install wooden spreaders at third points of frame rebate to maintain frame width, install centre brace to support head of frames 1200 mm and wider in accordance with ANSI A250.1; do not use temporary metal spreaders for bracing of frames 1.

.4 Place frames before construction of enclosing walls and ceilings, except for frames located in existing walls or partitions allowing for deflection of

adjacent construction to ensure that structural loads are not transmitted to frames, and as follows:

.1 Check and correct opening width and height, squareness, alignment, twist and plumb as frames are installed in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

.2 Metal Stud Partitions: Provide a minimum of three wall anchors per jamb for frames up to 2150 mm high and 1 additional anchor for each 600 mm over 2150 mm high; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb; attach wall anchors to studs with screws.

.3 Remove wooden braces after frames are securely fastened or attached to adjacent construction.

.5 Do not site weld unless approved by Consultant in writing for the specific screen.

.6 For frames over 1220 mm in width, provide vertical support at the centre of head.

.2 Window Frames:

.1 Installation of borrowed lights is same as for door frames.

.2 Site assemble large borrowed lights to provide true and even alignment with flush butt hairline jointing, all fasteners concealed.

.3 Site weld only when approved by Consultant in writing for the specific location.

.4 Align all horizontal rails in final assembly.

.5 Install sealant and back-up materials

.3 Frame Tolerances: Install frames to tolerances listed in ANSI A250.11, and as follows:

.1 Squareness: Maximum 1.6 mm measured across opening between hinge jam and strike jamb.

.2 Plumbness: Maximum 1.6 mm measured from bottom of frame to head level.

.3 Alignment: Maximum 1.6 mm measured offset between face of hinge jamb and strike jamb relative to wall construction.

.4 Twist: Maximum 1.6 mm measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.

.4 Install door silencers.

.5 Caulk perimeter of frames between frame and adjacent material at interior (primary air seal) and exterior (water shedding) seal sides of the door. Allow drainage at the sill. Primary air seal to be continuous with back angle at sill.

3.5 DOOR INSTALLATION

.1 Fit hollow metal doors accurately in frames within clearances required for proper operation; shim as necessary for proper operation.

.2 Install hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.3 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.

.1 Hinge side: 1.0 mm.

.2 Latchside and head: 1.5 mm.

.3 Finished floor, top of carpet: 6 mm; 13 mm at openings in non-fire rated separations where undercuts are indicated.

.4 Adjust operable parts for correct clearances and function.

3.6 FINISH REPAIRS

.1 Touch-up areas where galvanized coating has been removed or damaged with primer.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.7 ADJUSTING

.1 Adjust doors for smooth and balanced door movement

3.8 CLEANING

.1 Clean doors and frames.

3.9 FIELD PAINTING

.1 Prepare surfaces for field painting, to ASTM D6386 and ASTM D7396.

.2 Field painting: refer to Section 09 91 00 Painting. Protect weatherstrips from paint. Provide final finish, free of scratches or other blemishes.

exexeseseEND OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 13 - Steel Doors and Frames

.2 Section 08 71 00 - Door Hardware - General

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A208.1-2009, Particleboard.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

.1 AWMAC/AWI Architectural Woodwork Standards, Most Recent Edition.

.3 Canadian Hardwood Plywood and Veneer Association (CHPVA)

.1 CHPA Official Grading Rules for Rotary Cut Face Veneers.

.4 Canadian Standards Association (CSA International)

.1 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.

.2 CSA O132.5-M1992(R1998), Stile and Rail Wood Doors

.5 Environmental Choice Program (ECP)

.1 UL 2761 (formerly CCD-045), Sealants and Caulking Compounds.

.2 UL 2762 (formerly CCD-046), Adhesives.

.6 National Lumber Grades Authority (NLGA)

.1 NLGA Standard Grading Rules for Canadian Lumber Current Edition August 2017.

.7 Window & Door Manufacturers Association (WDMA):

.1 ANSI/WDMA 1.S.1A-13, Industry Standard for Interior Architectural Wood Flush Doors

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals.

.1 Submit manufacturer's printed product literature, specifications and data sheet.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets. Indicate VOC's:

.1 For caulking materials during application and curing.

.2 For door materials and adhesives.

.2 Submit shop drawings in accordance with Section 01 33 00 – Submittals.

.1 Show construction and materials used in cores, size and species of edge strip, thickness and species of cross-banding, and thickness and species of face veneer.

.2 Indicate locations, sizes and types of all doors to be supplied reference to the Door and Hardware Schedule.

.3 Indicate elevation of each kind of door, details of construction, location and extent of hardware blocking, requirements for factory finishing and other pertinent data.

.4 Provide details of perimeter and interface conditions.

.5 Include finishing specifications for doors to receive factory-applied finish.

.6 Include certifications as might be required to show compliance with specifications.

1.4 QUALITY ASSURANCE

.1 Fabricate doors in accordance with the AWMAC/AWI Architectural Woodwork Standards, Section 9 - Doors, Premium grade.

.2 Qualifications

.1 Manufacturer Qualification: Manufacturer specializing in products in this section who have a minimum of five years of documented experience and are a member in good standing of the Architectural Woodwork Manufacturers Association of Canada (AWMAC).

.3 Certifications:

.1 Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Preconstruction Testing:

.1 Certified test reports showing compliance with specified performance characteristics and physical properties.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver doors and panels to minimize storage on site and when site conditions conform to requirements for storage.

.2 Storage and Protection:

.1 Store and handle doors and panels in accordance with AWMAC requirements, and as follows:

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.

.2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.

.3 Protect doors from scratches, handling marks and other damage.

.4 Store doors away from direct sunlight.

.3 Packaging Waster Management

.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.6 WARRANTY

.1 Provide warranty issued in the name of the Owner stating that doors are warranted against defects in materials and workmanship for the life of the original installation.

.2 Warranty to include coverage for reasonable amount to remove, replace, refinish, and re-hang doors that do not meet accepted AWMAC tolerances.

Part 2 Products

2.1 FLUSH SOLID CORE DOORS

.1 Flush wood doors: solid core to AWMAC Standard.

.2 Dry lumber to an average moisture content of between 6 and 12% maximum at time of manufacture.

.3 Construction:

.1 Solid particleboard core having minimum density of 449 kg/m^3 in accordance with ANSI A208.1 and as follows:

.1 Stiles and Rails: Structural Composite Lumber (SCL) bonded to core to AWMAC Manual standards and as follows:

.1 Side Stiles: SCL with 16 mm hardwood edge, to match face veneers; no finger jointed materials permitted.

.2 Top and Bottom Rails: SCL with 16 mm soft wood cap.

.2 Reinforcement: with wood lock blocks

.3 Construction: 5-ply

.4 Use: interior

.2 Door cores to be fully bonded and abrasive planed or sanded prior to laminating faces to core materials.

.3 Door Thickness: 45 mm overall.

.4 Duty Rating: Heavy Performance Grade in accordance with WDMA I.S. 1-A.

.1 AWMAC Edge Type D-Solid Wood Edge Band; crossband edge covered and veneer face edge showing

.5 Face Panels:

.1 Decorative Wood Veneer: AWMAC quality grade and hardwood species, supplied from same source, clear and bright in colour with minimum of pin knots, mineral or sugar streaks, no open defects, heartwood, or wild grain, and minimal colour variation between flitches, meeting the requirements for Hardwood Plywood Veneer Association (HPVA) quality grade and hardwood species as indicated.

.1 Grade: Premium, with Grade AA faces

.2 Species: Select White Birch.

.3 Cut: Plain sliced (flat sliced)

.4 Match between Veneer Leaves: Book match.

.5 Finish: Factory finished as indicated below for transparent finishes.

.6 Minimum Thickness: 0.50 mm.

.7 Paired doors to have matching veneer pattern for uniform appearance.

2.2 ACCESSORIES

.1 Adhesive: Type I (waterproof)

.2 Wood Door Frames and Stops: Refer to Section 06 20 00 – Finish Carpentry.

.3 Metal Door Frames: Refer to Section 08 11 13 – Steel Doors and Frames.

2.3 FABRICATION

.1 Fabricate doors in accordance with AWS section 9.

.2 Vertical edge strips to match face veneer.

.3 Doors shall be pre-fitted, bevelled and machined at the factory for all mortise hardware items as per templates and approved hardware schedules provided.

.4 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

.5 Radius vertical edges of double acting doors to 60 mm radius.

2.4 FINISHES

.1 Factory finish doors in accordance with AWS Section 5 – Finishing, System 9 UV-Curable, Acrylated Epoxy, Polyester or Urethane as a minimum.

.2 Paint in accordance with Section 09 91 00 – Painting.

Part 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 INSTALLATION

.1 Unwrap and protect doors in accordance with AWMAC.

.2 Install doors and hardware in accordance with manufacturer's printed instructions and AWMAC.

.3 Adjust hardware for correct function.

.4 Secure transom and side panels by means of stops, concealed fasteners or countersunk screws concealed by means of wood plugs matching panel in grain and colour.

3.3 ADJUSTMENT

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking; clean doors and frames.

.3 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 13 – Steel Doors and Frames.

.2 Section 08 14 16 – Flush Wood Doors.

.3 Section 08 71 10 – Door Hardware Schedule.

.4 Division 26: Electrical wiring for magnetic strikes, electric releases and electric locks.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA)

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA)

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.3 Builders Hardware Manufacturers Association (BHMA)

.1 Directory of Certified Products.

.4 Door and Hardware Institute (DHI)

.1 Sequence and Format for the Hardware Schedule.

.2 ANSI/DHI A115.IG, Installation Guide for Doors and Hardware.

.5 Underwriters Laboratory (ULC)

.1 CAN/ULC S13.3 M90 (R1997) Amendment 1, Standard for Door Closers Intended for use with Swinging Doors.

.2 ULC/ORD-C14(e)-M1985 Guide for Hardware for Fire Doors and Emergency Exits.

.3 ULC/ORD-C228-1995 Door Closers and Holders.

.4 ULC C305-M1972 Panic Hardware.

.5 ULC-S132-2016 Tests for Emergency Exit and Emergency Fire Exit Hardware.

.6 ULC-S533-15 Standard for Egress Door Securing and Releasing Devices.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: convene pre-installation meeting in accordance with Section 01 31 19 – Project Meetings to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's warranty requirements.

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.1 Submit manufacturer's printed product literature, specifications and data sheets.

.2 Submit samples in accordance with Section 01 33 00 – Submittals:

.1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.2 After approval samples will be returned for incorporation in the Work.

.3 Hardware List:

.1 Submit contract hardware list in accordance with door schedule.

.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.3 Coordinate Division 28 Security Contractor, Division 26 Electrical Contractor and Division 8 Door and Hardware Contractors to jointly prepare, submit, and obtain certified approval from the Consultant shop drawings for work related to door access control systems prior to undertaking the on-site work. The joint submission will clarify and assign responsibility between these Divisions for labour and materials associated with the supply and installation of electronic and physical components for doors and access control. An individual drawing shall be submitted in AutoCadd format for each door within the project scope depicting both public and secure side of door and arrangement of access control and security components, conduit, and cabling.

.4 Keying Schedule:

.1 Submit keying schedule prepared by or under the supervision of qualified Architectural Hardware Consultant (AHC), detailing Owner's final keying instructions for locks, including schematic keying diagram and index each key set to unique door designations.

.5 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Supply two sets of wrenches for door closers, locksets, and fire exit hardware.

1.7 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.9 WASTE DISPOSAL AND MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

1.10 WARRANTY

.1 Provide written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

.2 Failures include, but are not limited to, the following:

.1 Structural failures including excessive deflection, cracking, or breakage.

.2 Faulty operation of operators and door hardware.

.3 Deterioration of metals, metal finishes, and other materials beyond normal weathering.

.3 Warranty Period: From date of Substantial Performance, and as follows:

Hardware Type	Warranty Term
Locks, latches and cylinders	2 years
Closers	25 years
Hinges	1 year
Panics	3 years
Miscellaneous	1 year
Electrical Hardware:	5 years

Part 2 Products

2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 Provide door hardware as indicated in hardware schedule.

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 Doors, padlocks and cabinet locks to be keyed as directed. Prepare detailed keying schedule in conjunction with Consultant.

.2 Provide keys in duplicate for every lock in this Contract.

.3 Provide three masterkeys for each MK or GMK group.

.4 Stamp keying code numbers on keys and cylinders.

.5 Provide construction keying.

Part 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.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 Install hardware to 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.

.2 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.3 Install key control cabinet.

.4 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.5 Remove construction cores when directed by Owner, install permanent cores and check operation of locks.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

3.5 DEMONSTRATION

.1 Keying System Setup and Cabinet:

.1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.

.2 Place file keys and duplicate keys in key cabinet on their respective hooks.

.3 Lock key cabinet and turn over key to Owner.

.2 Maintenance Staff Briefing:

.1 Brief maintenance staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.6 SCHEDULE

.1 As indicated in attached section 08 71 10.

END OF SECTION

HARDWARE SET 001

1 Single Door ND202 Existing Corridor From Administration 202
RHR

SCWD x PSF

3	Butts	5BB1 114mm x 101mm	
1	Lockset (F15)	L9485P-03B x Less “DO NOT DISTURB	626
		INDICATOR”	626
1	Mortise Cylinder	CY415T x Cam To Suit	626
1	Closer	4040XP EDA	689
1	Armor Plate	8400 – 900mm x 40mm LDW	630
1	Armor Plate	8400 – 900mm x 25mm LDW	630
1	Wall Stop	WS401/402 CCV	626

HARDWARE SET 002

1 Single Door ED203 Examination Room 205 To Chemical Processing Lab 203 LH
Existing Door & Frame 45 Min.

1	Lockset (F13)	L9456P-03B x L583-363 x L283-722	626
1	Closer	4040XP SCUSH	689
1	Armor Plate	8402 – 900mm x 40mm LDW	630
1	Armor Plate	8402 – 900mm x 25mm LDW	630

REUSE BALANCE OF EXITING HARWDARE

HARDWARE SET 003

1 Single Door ND204 Chemical Processing Room 203 To Lightroom 204 LH
900mm x 2134mm x 45mm HMD x PSF

3	Butts	5BB1 114mm x 101mm	652
1	Lockset (F13)	L9456P-03B x L583-363 x L283-722	626
1	Mortise Cylinder	CY415T x Cam To Suit	626
1	Closer	4040XP SCUSH	689
1	Armor Plate	8400 – 900mm x 40mm LDW	630
1	Set Seal	170AA – 1/DW x 2/DH	AL
1	Door Bottom	365AA x DW	AL
1	Mounting Bracket	770SPB	AL

HARDWARE SET 004

1 Single Door ND205 Clean Room 206 To Examination Room 205 RH
900mm x 2134mm x 45mm HMD x PSF

3	Butts	5BB1 114mm x 101mm NRP	652
1	Passage Set (F13)	L9456P-03B x L583-363 x L283-722	626
1	Closer	4040XP SCUSH	689
1	Armor Plate	8400 – 900mm x 40mm LDW	630
1	Armor Plate	8400 – 900mm x 25mm LDW	630
1	Floor Stop	FS438	626

HARDWARE SET 005

1 Single Door ND206 Existing Corridor To Clean Room 206 RH
900mm x 2134mm x 45mm SCWD x PSF

3	Butts	5BB1 114mm x 101mm NRP	652
1	Lockset (F15)	L9485P-03B x Less “DO NOT DISTURB INDICATOR”	626 626
1	Mortise Cylinder	CY415T x Cam To Suit	626
1	Closer	4040XP RW/PA	689
1	Armor Plate	8400 – 900mm x 40mm LDW	630
1	Armor Plate	8400 – 900mm x 25mm LDW	630
1	Floor Stop	FS438	626

HARDWARE SET 006

1 Single Door ND207 Clean Room 207 To Exhibit Storage 207 LH
900mm x 2134mm x 45mm HMD x PSF 45 Min.

3	Butts	5BB1WT 114mm x 125mm	652
1	Lockset (F15)	L9485P-03B x Less “DO NOT DISTURB INDICATOR”	626
1	Mortise Cylinder	CY415T x Cam To Suit	626
1	Closer	4040XP EDA – 180 degrees installation)	689
1	Armor Plate	8400 – 900mm x 40mm LDW	630
1	Armor Plate	8400 – 900mm x 25mm LDW	630
1	Wall Stop	WS401/402 CCV	626
1	Door Contact	679-05HM	

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

.2 Section 07 84 00 – Firestopping and Smokeseals

.3 Section 07 92 00 – Sealants

.4 Section 09 22 00 – Non-Structural Metal Framing

.5 Section 09 91 00 – Painting

1.2 REFERENCES

.1 Aluminum Association (AA)

.1 AA DAF-45-2003(R2009), Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM A653/A653M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

.3 ASTM C475/C475M-17, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.4 ASTM C514-04(2014), Specification for Nails for the Application of Gypsum Board.

.5 ASTM C557-03(2017), Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

.6 ASTM C635/C365M-17, Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

.7 ASTM C645-18, Standard Specification for Nonstructural Steel Framing Members

.8 ASTM C840-18, Specification for Application and Finishing of Gypsum Board.

.9 ASTM C954-18, Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

.10 ASTM C1002-18, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.11 ASTM C1047-14a, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.12 ASTM C1177/C1177M-17, Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.13 ASTM C1178/C1178M-18, Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.

.14 ASTM C1278/C1278M-17 Standard Specification for Fiber-Reinforced Gypsum Panel.

.15 ASTM C1280-13a, Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.

.16 ASTM C1325-18, Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units

.17 ASTM C1396/C1396M-17, Standard Specification for Gypsum Board.

.18 ASTM C1658/C1658M-13, Standard Specification for Glass Mat Gypsum Panels

.19 ASTM D3273-16, Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

.20 ASTM D4977/D4977M-03(2013)e1, Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion

.21 ASTM D5420-16, Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)

.22 ASTM E90-09(2016), Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

.23 ASTM F1267-18, Standard Specification for Metal, Expanded, Steel

.3 Association of the Wall and Ceilings Industries International (AWCI)

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.2 CAN/CGSB-51.34-M86., AMEND., Vapour Barrier, Polyethylene Sheet for Use in Building Construction. (Withdrawn)

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-10, Surface Burning Characteristics of Building Materials and Assemblies.

.2 CAN/ULC S114-05, Standard Method of Test for Determination of Non-Combustibility in Building Materials

.3 CAN/ULC S702.1:2014-AMD1, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals:

.1 Submit manufacturer's printed product literature, specifications and data sheet for each product specified.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.

.2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.

.3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

1.5 SITE CONDITIONS

.1 Environmental

.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.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers:

.1 CertainTeed Gypsum Canada Inc.

.2 CGC Inc.

.3 Georgia-Pacific Canada, Inc.

2.2 GYPSUM MATERIALS

.1 Standard board: to ASTM C1396/C1396M and as follows:

.1 Type: regular and fire resistant.

.2 Size: 1220 mm x maximum practical length.

.3 Thickness: as indicated on Drawings.

.4 Ends: square cut.

.5 Edges: tapered

.6 Acceptable materials:

.1 Wallboard (Type X), CertainTeed.

.2 Sheetrock (Firecode), CGC Inc.

.3 Toughrock Gypsum Wallboard (Fireguard), Georgia-Pacific Canada, Inc.

2.3 FRAMING MATERIALS

.1 Studs and Tracks: as indicated in Section 09 22 00.

.2 Metal furring runners, hangers, tie wires, inserts, anchors.

.3 Drywall furring channels: 0.75 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.4 Resilient clips: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

2.4 INSULATION MATERIALS

.1 Mineral Fiber Insulation for Fire and Smoke Rated Assemblies: Un-faced preformed GreenGuard™ or formaldehyde free binder fibrous insulation meeting the requirements of ULC S702; having maximum flame spread and smoke developed of 20/20 in accordance with CAN/ULC S102 and being non-combustible in accordance with CAN/ULC S114 and as follows:

.1 Type: 1.

.2 Width: to friction fit in stud spaces.

.3 Thickness: to fill a minimum of 90% of the cavity thickness.

.4 STC Ratings: as indicated on Drawings.

.5 Acceptable materials:

.1 Johns Manville, MinWool Sound Attenuation Fire Batts

.2 Owens-Corning Canada Inc., Sound Attenuation Fire Batts.

.3 Rockwool Inc., AFB Acoustical Fire Batt.

.2 Mineral Fiber Acoustical Insulation for Non-rated Assemblies: Un-faced, preformed GreenGuard™ or formaldehyde free binder fibrous insulation meeting the requirements of ASTM C423, ASTM E90, ASTM E413 and ULC S702 and as follows:

.1 Type: 1.

.2 Width: to friction fit in stud spaces.

.3 Thickness: to fill a minimum of 90% of the cavity thickness.

.4 @@@STC Ratings: as indicated on Drawings

.5 Acceptable materials:

.1 CertainTeed, NoiseReducer, Sound Control Fibre Glass Batts.

.2 Johns Manville, Sound Shield Glass Fibre Batts.

.3 Owen-Corning Canada LP., Thermafiber UltraBatt

2.5 CEILING/WALL ACCESS DOORS

.1 Architectural, flush mounting access panels for gypsum board installation, thickness and fire rating to match wall assembly, manufacturer's standard sizes selected to suit access requirements, complete with extruded aluminum frame, concealed hinge and a removable door panel, air tight gasket and screwdriver slot latch mechanism. Confirm proposed location and number of access doors with Consultant prior to installation.

.1 Basis-of-Design: Bauco Products Incorporated, Bauco Plus.

.2 Acceptable Manufacturers:

.1 Access Panel Solutions

.2 Acudor Products, Inc.

.3 Chicago Metallic/Rockfon Corporation

.4 Nystrom Building Products Co.

2.6 FINISHES

.1 Paint: in accordance with Section 09 91 00 – Painting.

2.7 ACCESSORIES

.1 Nails: to ASTM C514.

.2 Steel drill screws: to ASTM C1002.

.3 Stud adhesive: to CAN/CGSB-71.25.

.4 Laminating compound: as recommended by manufacturer, asbestos-free.

.5 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, ABS, PVC, or Zinc, 0.5 mm base thickness, perforated flanges, one piece length per location.

.6 Shadow mould: 35 mm high, snap-on trim, of 0.6 mm base steel thickness galvanized sheet pre-finished in satin enamel white colour.

.7 Strippable Edge Trim: Extruded PVC with pre-masked L-shaped tape on trim with tear away protective serrated strip for removal after compound and paint is applied, for use at areas where gypsum butts aluminum frames and where gypsum butts concrete or concrete block.

.8 Sealants: in accordance with Section 07 92 00 - Sealants.

.9 Acoustic sealant: non-hardening, non-skinning, permanently flexible and having VOC content less than the VOC limits of State of California's South Coast Air Quality Management District Rule #1168

.10 Firestopping: refer to Section 07 84 00 for firestopping and smokeseals for project as required for all new and existing surfaces, penetrations, irregular connections, and locations as described in Section 07 84 00.

.11 Insulating strip: rubberized, moisture resistant, 3 mm thick cork or closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

.12 Joint Treatment Materials: Provide joint compound and accessory materials in accordance with ASTM C475 and as follows:

- .1 Joint Tape:
  - .1 Interior Gypsum Board: Paper.
- .2 Joint Compound for Interior Gypsum Board: Vinyl based, non-asbestos, low dusting type compatible with other compounds applied on previous or for successive coats, and as follows:
  - .1 Pre-filling: Setting type taping compound.
  - .2 Embedding and First Coat: Drying type compound.
  - .3 Fill Coat: Drying type compound.
  - .4 Finish Coat: Drying type, sandable topping compound.
  - .5 Acceptable Materials:
    - .1 CertainTeed Dust Away
    - .2 CGC Dust Control

Part 3 Execution

3.1 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Do application of gypsum sheathing in accordance with ASTM C1280.

.3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm 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.

.7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

.8 Furr 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 C840, except where specified otherwise.

.11 Furr openings and around built-in equipment, cabinets, access panels, 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 transversely across studs and joists 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 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.2 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply single or double layer gypsum board to metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.3 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, in partitions where perimeter sealed with acoustic sealant.

.4 Apply board using stud adhesive on furring or framing.

.5 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.6 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.

.7 Install gypsum board with face side out.

.8 Do not install damaged or damp boards.

.9 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

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 on centre or 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 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.

.6 Construct control joints of preformed units or two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.

.7 Provide continuous polyethylene dust barrier behind and across control joints.

.8 Locate control joints where indicated and at changes in substrate construction at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

.9 Install control joints straight and true.

.10 Construct expansion joints at building expansion and construction joints. Provide continuous dust barrier.

.11 Install expansion joint straight and true.

.12 Splice corners and intersections together and secure to each member with 3 screws.

.13 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.14 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.

.15 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 0: No taping, finishing or accessories required for areas of temporary construction.

.2 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable and for plenum areas above ceilings, in attics or in concealed spaces.

.3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable and when gypsum is used as a substrate for tile.

.4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges and where areas are to receive a heavy coating of textured material.

.5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges and where light textures or wall coverings are to be applied.

.16 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.

.17 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.

.18 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.19 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.20 Mix joint compound slightly thinner than for joint taping.

.21 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.22 Remove ridges by light sanding or wiping with damp cloth.

.23 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM A653/A653M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 ASTM C645-14e1, Standard Specification for Nonstructural Steel Framing Members.

.3 ASTM C754-17, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 CSSBI LSF Technical Bulletin Volume 7, Number 1 Maximum Height Tables for Interior Non-Load bearing Partitions

.3 Environmental Choice Program (ECP).

.1 CCD-047-05, Architectural Surface Coatings.

.2 CCD-048-06, Surface Coatings - Recycled Water-borne.

1.3 ADMINSTRATIVE REQUIREMENTS

.1 Convene pre-installation meetings one week prior to beginning work of this Section in accordance with Section 01 31 19 – Project Meetings to:

.1 Verify project requirements.

.2 Review installation conditions.

.3 Co-ordinate with other building subtrades.

.4 Review manufacturer's instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, stud sizes as indicated on Drawings, roll formed from 0.45 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Use 0.75 mm heavy weight

framing to support fire rated door frames. Knock-out service holes at 460 mm centres.

.2 Runners: Width, gauge and galvanizing to match steel studs, and as follows:

.1 Double Runner Deflection Track: Outside runner using 50 mm flanges; inner runner 33 mm; maintaining 25 mm minimum deflection space.

.2 Slotted Deflection Track for Fire Separations: Premanufactured slotted top runner with 63 mm down standing legs and having 6 mm wide x 38 mm high slots spaced at 25 mm o/c along length of runner; tested and certified for use in fire rated wall construction:

.1 Acceptable materials:

.1 Brady Construction Innovations, SliptrackSystems

.2 Dietrich Metal Framing, SLP-TRK

.2 Base Runner: Bottom track with 33 mm upstanding legs.

.3 Acoustical sealant: to Section 07 92 00.

.4 Insulating strip: rubberized, moisture resistant 3 mm thick cork or foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

.5 Fasteners for Metal Framing: Type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at 400 mm on centre 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 track using screws, crimp method, or pop rivets.

.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 (1.52 mm thick) 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 and towel rails, attached to steel stud partitions.

.13 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.14 Extend partitions to ceiling height except where noted otherwise on drawings.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks. Use double track slip joint as indicated.

.16 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.17 Install two continuous beads of acoustical sealant or continuous insulating strip under studs and tracks around perimeter of sound control partitions.

3.2 CLEANING

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

3.3 STEEL STUD HEIGHT SCHEDULE

Maximum Stud Height (mm) based on lateral pressure of 240 Pa with deflection limit of L/240

Stud Spacing O.C.	300	400	600	300	400	600
Stud Depth (mm)	0.45 mm Steel Design Thickness			0.80 mm Steel Design Thickness		
64	3630	3430	3230	4240	3910	3530
92	4670	4370	4090	5440	5000	4500
102	5000	4670	4320	6070	5590	5000
152	6730	6020	5110	8150	7470	6580

Based upon tests with 13mm gypsum board both sides with screw fasteners spaced at 300 mm o.c. Heights also apply to greater gypsum board thickness and multiple gypsum board layers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 21 16 – Gypsum Board Assemblies

.2 Division 23 – HVAC

.3 Division 26 - Electrical

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.2 ASTM C635/C635M-17, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.

.3 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

.4 ASTM E580/E580M-17, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.

.5 ASTM E1264-14, Standard Classification for Acoustical Ceiling Products.

.6 ASTM E1477-98a (2017) e1, Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

.7 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.5 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S102-18, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals.

.1 Submit manufacturer's printed product literature, specifications and data sheet for each product specified.

.2 Submit samples in accordance with Section 01 33 00 – Submittals.

.1 Submit duplicate full size samples of each type of acoustical unit.

.2 Include accessories and mitered interior and exterior corners of wall mouldings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 5% of gross ceiling area for each pattern and type required for project.

.3 Ensure extra materials are from same production run as installed materials.

.4 Clearly identify each type of acoustic unit, including colour and texture.

.5 Deliver to Consultant, upon completion of the work of this section.

1.5 QUALITY ASSURANCE

.1 Single-Source Responsibility: Provide perimeter trim components, panels and grid components by a single manufacturer.

.2 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

.3 Regulatory Requirements:

.1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.

.4 Mock-Ups

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up 10 m^2 minimum of each type of acoustical panel ceiling including one inside corner and one outside corner

.3 Construct mock-up where directed.

.4 Allow 24 hours for inspection of mock-up by Consultant before proceeding with ceiling work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Reviewed mock-up may remain as part of the finished work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and as follows:

.1 Protect on site stored or installed absorptive material from moisture damage.

.2 Store extra materials required for maintenance, where directed by Consultant.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Waste Management and Disposal.

1.8 SITE CONDITIONS

.1 Environmental

.1 Permit wet work to dry before beginning to install.

.2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20-40% before and during installation.

.3 Store materials in work area 48 hours prior to installation.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis-of-Design Materials, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 Acoustic Panels:

.1 Armstrong World Industries Canada Ltd.

.2 CertainTeed

.3 CGC Interiors, A USG Company

.2 Suspension Systems:

.1 Armstrong World Industries Canada Ltd.

.2 CertainTeed

.3 CGC Interiors, A USG Company

.4 Chicago Metallic/Rockfon

2.2 PERFORMANCE/DESIGN CRITERIA

.1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

2.3 MATERIALS

.1 Acoustic Panels: conforming to ASTM E1264 and as indicated on Finish Schedule.

2.4 ACOUSTICAL SUSPENSION SYSTEM

.1 Heavy duty system to ASTM C635.

.2 Basic materials for suspension system: commercial quality cold rolled steel

.3 Suspension system: non fire rated, exposed tee bar grid width as appropriate for materials specified.

.4 Acceptable Materials: materials to match products specified, use only materials from same manufacturers of panel products and as follows:

.1 DX/DXL, CGC, A USG Company

.2 15/16” Classic, CertainTeed

.3 Prelude XL, Armstrong

.5 Exposed tee bar grid components: shop painted satin sheen white. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.

.6 Hanger wire: galvanized soft annealed steel wire:

.1 3.6 mm diameter for access tile ceilings.

.2 To ULC design requirements for fire rated assemblies.

.3 To suit seismic requirements and ceiling flatness requirements.

.4 2.78 mm diameter for other ceilings.

.7 Hanger inserts: purpose made.

.8 Carrying channels: 38 mm channel, galvanized steel.

.9 Accessories: splices, clips, wire ties, retainers and wall moulding flush, to complement suspension system components, as recommended by system manufacturer.

.10 Edge Mouldings and Trim: Sheet metal edge mouldings and trim selected from manufacturer's standard mouldings for edges and penetrations that fit specified acoustic panel edge and suspension system, and as follows:

.1 Provide edge mouldings fabricated to diameter required to fit circular penetrations exactly.

.2 Provide edge mouldings and trims that match width and configuration of exposed runners including the following configurations:

.1 Sheet Metal Fillers: Light zinc coated sheet steel finished to match T-bar

.2 Shadow Mould: Rolled sheet metal, one piece, having 19 mm x 13 mm flange and reveal

.3 Wall Mould: Channel or angle shape with a 25 mm or 22 mm exposed face

.11 System Accessories:

.1 Sealant: Acrylic type as specified in Section 07 92 00 for use in exposed locations, colour to match ceiling grid.

Part 3 Execution

3.1 EXAMINATION

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

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.3 INSTALLATION OF SUSPENSION SYSTEM

.1 Installation: in accordance with ASTM C636 except where specified otherwise.

.2 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.

.3 Conform to building code for seismic restraints of ceiling grid.

.4 Do not erect ceiling suspension system until all mechanical and electrical work above ceiling has been inspected by Consultant.

.5 Secure hangers to overhead structure using attachment methods acceptable to Consultant.

.6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.

.7 Lay out system according to reflected ceiling plan.

.8 Ensure suspension system is co-ordinated with location of related components.

.9 Install wall moulding to provide correct ceiling height.

.10 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers grilles and speakers.

.11 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.12 Interlock cross member to main runner to provide rigid assembly.

.13 Finished ceiling system to be square with adjoining walls and level within 1:1000.

.14 Expansion joints:

.1 Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, painted colour as directed, 25% narrower than space between 2 'T' bars.

.2 Supply and install "Z" shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25 mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.

3.4 INSTALLATION OF ACOUSTIC PANELS

.1 Install acoustic panels and tiles in ceiling suspension system.

3.5 APPLICATION

.1 Refer to reflected ceiling plan.

.2 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.6 SYSTEM INTEGRATION

.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.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

.2 Section 07 92 00 – Sealants

.3 Section 09 99 00 – Finish Schedule

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM F710-17, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

.2 ASTM F1066-04(2014)e1, Standard Specification for Vinyl Composition Floor Tile.

.3 ASTM F1303-04(2014), Standard Specification for Sheet Vinyl Floor Covering with Backing.

.4 ASTM F1344-15, Standard Specification for Rubber Floor Tile.

.5 ASTM F1516-13(2018), Standard Practice for Sealing Seams of Resilient Flooring Products by the Heat Weld Method (when Recommended).

.6 ASTM F1700-18a, Standard Specification for Solid Vinyl Floor Tile.

.7 ASTM F1860-14e1, Standard Specification for Rubber Sheet Floor Covering With Backing.

.8 ASTM F1861-16, Standard Specification for Resilient Wall Base.

.9 ASTM F1869-16a, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

.10 ASTM F1913-04(2014), Standard Specification for Vinyl Sheet Floor Covering Without Backing.

.11 ASTM F2034-08(2013), Standard Specification for Sheet Linoleum Floor Covering.

.12 ASTM F2195–13, Standard Specification for Linoleum Tile Flooring, Type 1

.13 ASTM F2170-18, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113-16, Architectural Coatings.

.2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.4 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

1.3 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.1 Submit one copy of product data for each type of product specified.

.2 Submit WHMIS Material Safety Data Sheets (MSDS) for flooring adhesive and seam welding. Indicate VOC content.

.2 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base.

.3 Closeout Submittals:

.1 Provide manufacturer's printed recommendations for general maintenance, including cleaning instructions and guidelines for use of waxes and other protective coatings and appearance enhancers in accordance with Section 01 78 00 – Closeout Submittals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 5 % of each colour, pattern and type flooring material required for project for maintenance use.

.3 Extra materials 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 to Consultant upon completion of the work of this section.

.6 Store where directed by Consultant.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Provide products that meet requirements of ULC S102.2 as applicable for required flame spread ratings; labelled and listed by Underwriters Laboratories of Canada (ULC), or another testing and inspecting agency acceptable to authorities having jurisdiction.

.2 Qualifications: Provide proof of qualifications when requested by Consultant:

.1 Installer shall be Trade Qualified for their specific flooring products by the National Floor Covering Association.

.2 Resilient Flooring Installer: Use an installer who is competent in heat welding and have a minimum of three (3) years documented experience in the installation of resilient sheet flooring and seams in accordance with manufacturer's training or certification program:

.3 Source Limitations: Obtain each type, colour, and pattern of flooring or accessories specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

.3 Mock-Up

.1 Provide mock-up in accordance with Section 01 45 00 – Quality Control.

.2 Construct mock-ups as directed by Consultant to verify selections made under sample Submittals and to demonstrate aesthetic effects, patterns, and qualities of materials, and execution before installing flooring

materials and accessories in accordance with requirements in Section 01 45 00 – Quality Control.

.3 Install in a representative room designated by the Consultant, a sample flooring installation of at least 10 m^2 in area showing pattern as directed by Consultant, colour matching, and longitudinal and transverse joints for the Consultants' review and acceptance.

.4 The mock-up room shall represent the minimum acceptable standard for the Work when identified modifications to the mock-up are completed, reviewed, and accepted by the Consultant.

.5 Accepted mock-up room installation can remain as part of the Work.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials in good conditions to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

.3 Store materials in a clean, dry, enclosed space off the ground, and protect from the weather and from extremes of heat and cold. Protect adhesive from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

.4 Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.8 SITE CONDITIONS

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

1.9 WARRANTY

.1 Provide Manufacturers Warranty for product to be free from manufacturers defects for a period of five (5) years from date of substantial performance.

Part 2 Products

2.1 MATERIALS

.1 Basis-of-Design: Materials and colours listed below form the Basis-of-Design materials for this project.

.2 Materials other than named products Basis-of-Design materials may be acceptable to the Consultant; submit information in accordance with Section 01

62 00 – Product Options no later than seven (7) days prior to bid closing date and as follows:

.1 Proposed alternates shall match colour range, texture and performance characteristics of named products, and shall not require a change to colour board for Project.

.2 Proposed alternates found acceptable by Consultant will be listed in an Addendum.

.3 The Consultant is not obliged to accept any materials presented for their review and does not need to provide reasons for rejection of proposed alternates.

2.2 SHEET FLOORING

.1 Slip resistant vinyl to ASTM F1913 and as indicated on Drawings.

2.3 RESILIENT BASE

.1 Resilient Base: to ASTM F1861, and as follows:

.1 Type: TS – Thermoset Vulcanized Rubber.

.2 Group: 1 – solid

.3 Length: 36.5 meter rolls.

.4 End Stops and External Corners: premoulded.

.5 Colour: as indicated in Section 09 99 00 – Finish Schedule.

2.4 ACCESSORIES

.1 Resilient Transition and Edge Strips: Extruded vinyl shapes meeting or exceeding ADA Recommendations for change of level transitions for transition between floors finishes having different levels; acceptable materials as follows:

.1 The following list is included to indicate the most commonly used transition and edge strip accessories; additional materials may be required where transition heights differ from the products listed and shall be included as a part of the Contract.

.1 Transition Strip: Resilient Flooring to Concrete Slab Transition: Johnsonite SSR-XX-B Transitional Moulding between materials having a thickness to materials having no thickness; colour: selected from manufacturer’s standard range.

.2 Transition Strip: Resilient Flooring to Resilient Flooring Transition: Johnsonite CTA-XX-N Transitional Moulding between materials having the same thickness; colour: selected from manufacturer’s standard range.

.2 Metal edge strips:

.1 Extruded, smooth, polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.3 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious paste or 2 part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product.

.4 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

.1 Vinyl adhesives:

.1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.2 Cove base adhesives:

.1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.5 Welding rod: designed to weld seams of sheet flooring, as recommended by flooring manufacturer, colour as indicated in Section 09 99 00 – Finish Schedule.

.6 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

.1 Sealer: maximum VOC limit 100 g/L to SCAQMD Rule 1113.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 SITE VERIFICATION OF CONDITIONS

.1 Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry ,and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring substrate.

.2 Ensure concrete floors have maximum 2.5% moisture content, exhibit normal alkalinity and no carbonization or dusting.

.3 Ensure concrete floors are clean, smooth, and flat to plus or minus 3 mm over 3 meters.

3.3 PREPARATION

.1 Remove existing resilient flooring.

.2 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.5 Prohibit traffic until filler is cured

.6 Clean substrates of contaminates.

.7 Alkalinity and Adhesion Testing: perform tests recommended by manufacturer. Proceed with installation after substrates pass testing.

.8 Moisture Testing: perform tests recommended by manufacturer and as follows:

.1 Perform anhydrous calcium chloride test ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapour-emission rate of 3 lb of water/1000 sq. ft in 24 hours.

.2 Perform relative humidity test using in situ probes, ASTM F2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

.3 Proceed with installation after substrates pass testing.

.9 Prime or seal concrete slab or plywood sub-floor to resilient flooring manufacturer's printed instructions.

3.4 INSTALLATION: GENERAL

.1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.3 Cut flooring around fixed objects.

.4 Install feature strips and floor markings where indicated. Fit joints tightly.

.5 Install flooring in pan type floor access covers. Maintain floor pattern.

.6 Continue flooring over areas which will be under built-in furniture.

.7 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

.8 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

.9 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 INSTALLATION: SHEET FLOORING

.1 Lay flooring with seams parallel to building line or as indicated on drawings to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.2 Run sheets in direction of traffic, double cut sheet joints and continuously seal or heat weld according to manufacturer's printed instructions.

.3 Provide seams in strict accordance with manufacturer’s recommendations. Heat weld seams with welding rod when heat welded seams are a permitted option by manufacturer.

.4 As installation progresses and after installation is complete, roll resilient sheet flooring in accordance with manufacture’s instructions.

3.6 INSTALLATION: BASE

.1 Lay out base to keep number of joints at minimum.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

.8 Use toeless type base where floor finish will be carpet, coved type elsewhere.

.9 Install toeless type base before installation of carpet on floors.

.10 Heat weld base in accordance with manufacturer's printed instructions.

3.7 INSTALLATION: ACCESSORIES

.1 Install feature strips and floor markings where indicated. Fit joints tightly.

.2 Install metal edge strips at unprotected and exposed edges where flooring terminates.

.3 Install cove support strips continuously where sheet flooring is to be coved to vertical surfaces.

.4 Install cap strips continuously to cover top edge of coved sheet flooring. Mitre corners. Top of cap strip shall be straight and level to variation of plus or minus 3 mm over 3 m straight edge.

3.8 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.9 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Remove excess adhesive from floor, base and wall surfaces without damage.

.3 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.10 PROTECTION

.1 Protect new floors from time of final set of adhesive until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Provide labour, materials, tools and other equipment, services and supervision required to complete interior and exterior, including above roof, painting and decorating work.

.2 Surface preparation for this section will be limited to priming and back-priming, and specific pre-treatments noted in this section or as specified in the Master Painters Institute (MPI) Painting Specification Manual.

1.2 RELATED REQUIREMENTS

.1 Other sections of the specification requiring painting refer to this section. Coordinate requirements of referencing sections.

1.3 REFERENCES

.1 Environmental Choice Program (ECP):

.1 Paints and Surface Coatings, Low VOC Product Listings

.2 The Master Painters Institute (MPI):

.1 New Surfaces: Architectural Painting Specification Manual.

.2 Existing Surfaces: Interior Maintenance Repainting Manuals.

.3 The Society for Protective Coatings (SSPC):

.1 Coating Materials Guidelines

.2 Surface Preparation Guidelines

.3 Application, Inspection and Quality Control Guidelines

.4 Definitions

.1 Gloss Levels: Standard coating terms defined by MPI Manual apply to products of this Section as follows, and are used on Drawing or as indicated in this Section to designate required gloss levels for indicated areas:

.1 G1 – Matte Finish (flat): Matte to low sheen finish with a gloss range of 0 to 10 when measured at 85° to meter and 0 to 5 when measured at 60°.

.2 G2 – Velvet: Matte to low sheen finish with a gloss range of 10 to 35 when measured at 85° to meter and 0 to 10 when measured at 60°.

.3 G3 – Eggshell: Low sheen finish with a gloss range of 10 to 35 when measured at 85° to meter and 10 to 25 when measured at 60°.

.4 G4 – Satin: Low to medium sheen with a gloss range of minimum 35 when measured at 85° to meter and 20 to 35 when measured at 60°.

.5 G5 – Semi-Gloss: Medium sheen finish with a gloss range of 35 to 70 when measured at 60° to meter.

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00 – Submittals.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Product Data: Submit list of all painting materials used for the Work to the Consultant for review prior to ordering materials for each paint system indicated, including block fillers and primers:

.1 Material List: An inclusive list of required coating materials indicating each material and cross reference specific coating, finish system, and application; identify each material by manufacturer's catalogue number and general classification.

.2 Base Information: Confirmation of manufacturer’s ability to supply paint in a variety of base tints, specific to the range of colours being used on this project; indicate colour of base tint used and amount of colourant added to establish Scheduled colours.

.3 Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

.2 Samples: Provide stepped samples, defining each separate coat, including block fillers and primers using representative colours required for the project; label each sample for location and application, and as follows:

.1 Samples for Verification: When requested by the Consultant, provide samples for each colour and material, with texture to simulate actual conditions, on representative samples of the actual substrate as follows:

.1 Painted Wood: 200 mm long or square samples for each colour and material on representative sample wood used for the Work.

.2 Stained or Natural Wood: 200 mm long or square samples of natural or stained wood finish on representative species of wood used for the Work.

.3 Painted Gypsum Board: 200 mm long or square samples for each colour and material.

.3 Informational Submittals: Provide the following submittals when requested by the Consultant:

.1 Certification: Submit certification reports for paint products indicating that they meet or exceed low VOC and coloured base requirements listed in this Section.

.2 Purchase Orders: Retain purchase orders, invoices and other documents for verification of compliance with specification and design requirements.

1.5 PROJECT CLOSEOUT SUBMISSIONS

.1 Operation and Maintenance Data: Submit copies of paint manufacturer’s written maintenance information for inclusion in the operations manual in accordance

with Section 01 78 00 including specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.

.2 Maintenance Materials: Provide 1 litre of each paint colour used on the project, store where directed.

1.6 QUALITY ASSURANCE

.1 Conform to the standards contained in the MPI Manual.

.2 Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in service performance, and as follows:

.1 Have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work.

.2 When requested provide a list of the last three comparable jobs including, name and location, specifying authority, start and completion dates and cost amount of the painting work.

.3 Only qualified journeymen who have a Tradesman Qualification Certificate of Proficiency shall be engaged in painting and decorating work.

.4 Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

1.7 FIRELD CONDTIONS

.1 Environmental Requirements

.1 Conform to MPI Manual and manufacturer’s requirements.

.2 Perform no painting or decorating work when the ambient air and substrate temperatures, relative humidity and dew point and substrate moisture content is below or above requirements for both interior and exterior work.

.3 Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

.4 Ensure adequate continuous ventilation and sufficient heating and lighting is in place.

.5 Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be regarded as hazardous products. Recycle and dispose of same subject to regulations of applicable authorities having jurisdiction.

.6 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground retain cleaning water and filter out and properly dispose of sediments.

.7 Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

Part 2 Products

2.1 MATERIALS

.1 Primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, and other painting materials shall be in accordance with the MPI Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

.2 Materials such as linseed oil, shellac, and other accessory materials shall be the highest quality product of an approved manufacturer listed in the MPI Manual and shall be compatible with other coating materials.

.3 All materials and paints shall be lead and mercury free and shall have low VOC content where possible.

Part 3 Execution

3.1 PREPARATION OF SURFACES:

.1 Prepare surfaces in accordance with MPI Manual requirements. Refer to the Manual for specific surface preparation requirements for each substrate material.

3.2 APPLICATION

.1 Paint when substrates and environmental conditions (heating, ventilation, lighting and completion of other work) are acceptable for applications of products specified in this Section.

.2 Paint surfaces requiring paint or stain finish to Premium MPI Manual finish requirements with application methods in accordance with best trade practices for type and application of materials used.

.3 Continue paint finishes through behind wall mounted items.

.4 Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.

.5 Apply a minimum of four coats of paint where deep or bright colours are used to achieve satisfactory results.

3.3 INTERIOR SURFACES

.1 Paint interior surfaces in accordance with the MPI Manual painting systems listed in this section.

.2 Structural Steel and Metal Fabrications: columns, beams, joists and miscellaneous metal:

.1 INT 5.1R - High performance architectural latex; gloss level as directed.

.3 Galvanized Metal (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etcetera):

.1 INT 5.3B – Water based light industrial coating semi-gloss finish.

.4 Dressed Lumber (including doors, door and window frames, casings, mouldings, etcetera):

.1 INT 6.3E – Semi-transparent stain / polyurethane varnish satin gloss finish.

.5 Plaster and Gypsum Board (gypsum board, drywall, and other sheet gypsum materials):

.1 INT 9.2B – High performance architectural latex semi-gloss finish.

.6 Acoustic Panels and Tiles, touch up paint:

.1 INT 9.3A – Latex flat finish.

3.4 MECHANICAL / ELECTRICAL EQUIPMENT AND RELATED SURFACES:

.1 Unless otherwise specified or noted, paint all “unfinished” conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, in the following areas:

.1 where exposed-to-view in all exterior and interior areas.

.2 in all interior high humidity interior areas.

.3 in all boiler room, mechanical and electrical rooms.

.2 In unfinished areas leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.3 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.4 Do not paint over nameplates.

.5 Paint the inside of all ductwork where visible behind louvers, grilles and diffusers for a minimum of 460 mm (18”) or beyond sight line, whichever is greater, with primer and one coat of matt black (non-reflecting) paint.

3.5 MAINTENANCE REPAINTING

.1 Paint existing interior previously finishes surfaces in accordance with the MPI Manual painting systems listed in this section.

3.6 RESTORATION

.1 Clean and re-install all hardware items that were removed before painting operations were undertaken, ensuring that tagged or labelled items are returned to the exact position from which they were removed.

.2 Clean, prime and re-paint all bolts, nuts and fasteners after torqueing or re-tightening following specified paint finish.

.3 Remove protective coverings and warning signs as soon as possible after operations cease.

.4 Protect freshly painted surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

3.7 SITE QUALITY CONTROL

.1 Painted surfaces will be considered to lack uniformity and soundness if any of the following defects are apparent at time of field review when viewed from a distance of 1220 mm from the painted surface:

- .1 Runs, sags, hiding or shadowing by inefficient application methods
- .2 Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles

.2 Painted surfaces will be considered as deficient if any of the following defects are apparent at time of field review, regardless of viewing distance.

- .1 Damage due to touching before paint is sufficiently dry or any other contributory cause.
- .2 Damage due to application on moist surfaces or caused by inadequate protection from the weather.
- .3 Damage or contamination of paint due to windblown contaminants (dust, sand blast materials, salt spray, etcetera)

.3 Painted surfaces found as unacceptable shall be replaced or repaired at no cost to the Owner or Consultant:

- .1 Small affected areas may be touched up
- .2 Large affected areas or areas without sufficient dry film thickness of paint shall be repainted.
- .3 Runs, sags or damaged paint shall be removed by scraper or by sanding before application of new paint coats.

3.8 CLEANING

.1 Remove all paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

.2 Keep work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of it in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water or solvents, and other cleaning and protective materials (rags, drop cloths, masking papers, etcetera), paints, thinners, paint removers and strippers in accordance with the safety requirements of authorities having jurisdiction.

3.9 PROTECTION

.1 Protect newly painted exterior surfaces from rain and snow, condensation, contamination, dust, salt spray and freezing temperatures until paint coatings are completely dry.

.2 Curing periods shall exceed the manufacturer’s recommended minimum time requirements.

.3 Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work area as required.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society of Testing and Materials (ASTM)

.1 ASTM A1008/A1008M-16, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.

.2 ASTM B221-14/B221M-13, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.3 ASTM D4446/D4446M-13, Standard Test Method for Anti-Swelling Effectiveness of Water-Repellent Formulations and Differential Swelling of Untreated Wood When Exposed to Liquid Water Environments

.2 Canadian General Standard Board (CGSB)

.1 CAN/CGSB 1.300-2000, Applied Coating System of Semigloss Baked Finish for Metal Office Furniture. (Withdrawn)

.2 CAN/CGSB-44.40-2001 AMEND., Steel Clothing Locker. (Withdrawn)

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Coordination

.1 Coordinate size and location of prefabricated metal bases for metal lockers.

.2 Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related work specified in other Sections so that metal lockers can be supported and installed as indicated.

1.3 QUALITY ASSURANCE

.1 Installer to be an authorized representative of metal locker manufacturer for installation and maintenance of locker systems for this Project.

.2 Obtain metal lockers and accessories through one source from a single manufacturer. Do not modify intended aesthetic appearance of metal lockers without the Consultant's written approval; submit comprehensive explanatory data to Consultant for review where modifications are necessary to meet project requirements before submission of Bids.

1.4 SITE CONDITIONS

.1 Site Measurements: Verify location of concealed framing, blocking, and reinforcements that support metal lockers before they are enclosed, and configuration of recessed openings by Site measurements before fabrication and indicate measurements on Shop Drawings.

.2 Established Dimensions: Establish recessed opening dimensions and proceed with fabricating metal lockers without Site measurements where Site measurements cannot be made without delaying the Work. Coordinate wall and floor construction so that actual recessed opening dimensions correspond to established dimensions

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section [and as established by the Basis-of-Design Materials], manufacturers offering products that may be incorporated into the Work include the following:

.1 Canadian Locker Company Limited

.2 General Storage Systems

.3 Hadrian Inc.

.4 Hovik Manufacturing Inc.

.5 Shanahan’s Manufacturing Ltd.

2.2 MATERIALS

.1 Cold Rolled Steel Sheet: Commercial Steel (CS) Type B in thicknesses indicated, suitable for exposed applications in accordance with ASTM A1008/A1008M.

.2 Steel Plates, Shapes, and Bars: In accordance with CAN/CSA G40.20/G40.21, Grade 300W.

.3 Fasteners: Zinc or nickel plated steel, slotless type exposed bolt heads, and self locking nuts or lock washers for nuts on moving parts.

.4 Anchors: Select material, type, size, and finish required for secure anchorage to each substrate, as follows:

.1 Provide nonferrous metal or hot dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance.

.2 Provide toothed steel expansion sleeves for drilled-in-place anchors.

2.3 MANUFACTURED UNITS

.1 Lockers: supplied by Owner, installed by Contractor.

Part 3 Execution

3.1 EXAMINATION

.1 Examine walls, floors, and support bases for compliance with requirements for installation tolerances and other conditions affecting performance of work.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 Assemble and install lockers in accordance with manufacturer's written instructions.

.2 Securely fasten lockers to grounds and nailing strips.

.3 Install wall trim around recessed locker banks.

.4 Install filler panels (false fronts) where indicated and where obstructions occur.

.5 Install finished end and back panels to exposed ends and backs of locker banks.

.6 Install locker numbers.

3.3 REPAIR

.1 Touch up marred finishes or replace metal lockers that cannot be restored to factory finished appearance.

3.4 ADJUSTING

.1 Clean, lubricate, and adjust hardware.

.2 Adjust doors and latches to operate easily without binding.

.3 Verify that integral locking devices operate properly.

3.5 PROTECTION

.1 Protect metal lockers from damage, abuse, dust, dirt, stain, or paint.

.2 Do not permit metal locker use during construction.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 40 00 – Architectural Woodwork

.2 Section 09 21 16 – Gypsum Board Assemblies: Coordination with built-in appliances and adjacent wall construction.

.3 Division 22 – Plumbing: Coordination of pipes and fittings and other materials.

.4 Division 26 – Electrical: Coordination conduit, wiring and other materials.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-17, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels, and for General Applications.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-C22.2 No.120-13 (R2018), Refrigeration Equipment.

.2 CAN/CSA-C22.2 No.150-16, Microwave Ovens.

.3 CAN/CSA-C388-15, Energy Performance and Capacity of Household Microwave Ovens.

1.3 ACTION SUBMITTALS / INFORMATION SUBMITTALS

.1 Submit product data in accordance with Section 01 33 00 – Submittals:

.1 Include manufacturers name, type, model, year, dimensions, capacity and finishes for each appliance.

.2 Include details of operation, servicing, maintenance and recommended spare parts list.

1.4 QUALITY ASSURANCE

.1 Obtain products from a qualified manufacturer having a service centre capable of providing training, parts, and emergency maintenance repairs within 50 km of project site.

.2 Appliances shall be labelled in accordance with requirements of CSA, ULC, CGA and other standards acceptable to the Authorities Having Jurisdiction.

.3 Provide appliances that carry labels indicating energy cost analysis (estimated annual operating costs) and efficiency information qualifying for labelling under the Energy Star Program.

1.5 WARRANTY

.1 Provide manufacturer's standard form of warranty stating that each appliance specified will repaired or replaced that fail in materials or workmanship within manufacturers standard warranty period.

Part 2 Products

2.1 MANUFACTURERS

.1 Materials other than named products Basis-of-Design materials may be acceptable to the Consultant; submit information in accordance with Section 01 62 00 – Product Options no later than seven (7) days prior to bid closing date and as follows:

.1 Proposed alternates shall match colour range and performance characteristics of named products.

.2 Proposed alternates found acceptable by Consultant will be listed in an Addendum.

.3 The Consultant is not obliged to accept any materials presented for their review and does not need to provide reasons for rejection of proposed alternates.

.2 Substitutions for materials of this section will be considered after the close of bids in accordance with Section 01 62 00 – Product Options.

2.2 APPLIANCES

.1 As indicated on Finish Schedule.

Part 3 Execution

3.1 EXAMINATION

.1 Examine conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.

.2 Examine roughing-in for piping and electrical systems to verify actual locations of piping and electrical connections before equipment installation.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 Install equipment in accordance with manufacturer's instructions.

.2 Coordinate connection of mechanical and electrical services.

.3 Securely anchor built-in units to supporting cabinets or countertops with concealed fasteners; verify that clearances are adequate for proper functioning and rough openings are completely concealed.

.4 Place free-standing units in final locations after finishes have been completed in each area; verify that clearances are adequate to properly operate equipment.

.5 Adjust equipment for smooth and proper operation.

3.3 SITE QUALITY CONTROL

.1 Test each appliance specified in this Section to verify proper operation; make necessary adjustments.

.2 Verify that accessories required have been furnished and installed.

3.4 CLEANING

.1 Remove packing material from appliances and leave units in clean condition, ready for operation.

3.5 DEMONSTRATION

.1 Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain appliances.

END OF SECTION

Part 1 General

1.1 INTENT

.1 Work of this Section includes manually operated sunscreen roller shades at locations as indicated on Drawings.

1.2 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

.2 Section 09 21 16 – Gypsum Board Assemblies

.3 Section 09 51 13 – Acoustical Panel Ceilings

1.3 REFERENCES

.1 American Architectural Manufacturer's Association (AAMA)

.1 AAMA 611-14, Voluntary Specification for Architectural Anodized Aluminum.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM B429/B429M-10e1, Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube

.2 ASTM D1784-11, Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

.3 ASTM G21-15, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

.3 Environmental Choice Program (ECP)

.1 ECP6694, Office Furniture.

.4 National Fire Protection Agency (NFPA)

.1 NFPA 70, National Electrical Code 2017 Edition.

.2 NFPA 701 (2015 Edition), Fire Tests for Flame-Resistant Textiles and Films.

.5 Underwriters Laboratories Canada (ULC):

.1 CAN/ULC S109-14 Flame Tests of Flame Resistant Fabrics and Films

1.4 ACTION SUBMITTALS / INFORMATIONAL SUBMITTALS

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

.1 Submit information for each type of product indicated including, but not limited to, the following:

.1 Styles, material descriptions, construction details, dimensions of individual components and profiles, features, and finishes.

.2 Operating instructions.

.2 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.1 Indicate dimensions in relation to window jambs, operator details, head and sill anchorage details, hardware and accessories details.

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

.1 Submit one representative working sample of each type of shading device.

.2 After approval samples will be returned for incorporation into the Work.

1.5 CLOSEOUT SUBMITTALS

.1 Submit closeout data in accordance with Section 01 78 00 – Closeout Submittals:

.1 Methods for maintaining roller shades and finishes.

.2 Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

.3 Operating hardware.

1.6 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

.2 Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

.3 Regulatory Requirements:

.1 Flame Spread Rating: Provide roller shade panel materials with flame spread and smoke developed characteristics required by Authority Having Jurisdiction, as determined by testing identical products in accordance with CAN/ULC S109.

.2 Anti-Microbial Characteristics: 'No Growth' per ASTM G21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver material to site in manufacturer standard packaging. Store and handle as recommended by manufacturer.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.

1.9 WARRANTY

.1 Manufacturer Warranty: Provide manufacturer’s warranty from commencing from date of Substantial Performance covering the following minimum requirements for materials:

.1 Shade Hardware: ten (10) years.

.2 Shade Fabric/Shade Cloth: ten (10) years.

.3 Metal Coatings: ten (10) years.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis-of-Design Materials, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:

.1 MechoShade Systems, Inc.

.2 Nysan Shading Systems Ltd.

.3 Silent Gliss Inc.

.1 Solarfective Products Ltd.

.4 Sunproject Shading

2.2 ROLLER SHADE COMPONENTS

.1 Roller Tube: One piece extruded 6061-T6 or 6063-T6 aluminum roller tube meeting the requirements of ASTM B429, having anodized finish as follows:

.1 Protective Finish: AA-M12 Mechanical Finish; C22 Non-Specular; A21 Chemical Finish, etched, medium matte anodic coating; clear coating 0.025 mm or thicker in accordance using AMA 611; roller tube assemblies having mill finish will not be acceptable.

.2 Tube Diameter and Thickness: Manufacturers recommended engineered diameter, wall thickness and aluminum grade as required for maximum allowable deflection of L/700.

.3 Tube Configuration: Extrude tube with provision made for mechanical engagement with the operator and drive assembly; and having channels to accept fabric attachment spline.

.2 Fabric Spline: Extruded vinyl profile, welded to fabric band or panel, allowing removal and re-installation of fabric bands or panels without removing the roller tube and hardware and having the following characteristics:

.1 Fabric bands or panels must be replaceable on site.

.2 Attachment of the fabric to the tube with double-sided adhesive tapes, adhesives, staples or rivets will not be acceptable.

.3 Hem Bars and Hem Bar Pockets:

.1 Custom shaped oval, ergonomic aluminum profile; nominal 35 mm wide x 10 mm thick and having 1.8 mm wall thickness having matching end caps, pre-weighted to maintain bottom of shade fabric straight and flat; colour as selected by Consultant; and with manufacturer’s standard light seal applied to underside of hem bar; attached to fabric panel using welded fabric spline.

.4 Fasteners: Non-corrosive fasteners as recommended by manufacturer.

.5 Valance: As indicated by manufacturer's designation for style and colour

.6 Mounting: Inside mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.

2.3 SHADE MATERIALS

.1 Shading Material: Non-PVC-coated fibreglass, and as indicated in Finish Schedule.

.2 Direction of Roll: Regular, from back of roller.

.3 Mounting Brackets: Galvanized or zinc-plated steel.

.4 Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings; removable design for access.

.5 Top/Back Cover: L shaped; material and finish to match fascia; combining with fascia and end caps to form a six-sided headbox enclosure sized to fit shade roller and operating hardware inside.

.6 Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide exposed-to-view, external-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.

.7 Shade Operation: Manual; with continuous loop bead chain, clutch, and cord tensioner and bracket lift operator.

.1 Pull: Manufacturer's standard hand grip finger ring engaged pull.

.2 Loop Length: Full length of roller shade.

.3 Bead Chain: Stainless steel.

.4 Cord Tensioner Mounting: Wall

.5 Operating Function: Stop and hold shade at any position in ascending or descending travel

2.4 OPERATORS

.1 Manual Chain Operator:

.1 Mounting Brackets: Angle shaped brackets size and thickness to manufacturer’s standard; unitized pre-moulded assembly; allowing for continuous front or back roll fascia across multiple shades without exposed fasteners.

.2 Chain Drive System: Continuous loop of #10 stainless steel bead chain having a rated strength of 40 kg to prevent chain breakage under normal operating conditions; and as limited by ANSI/WCMA A100.1 safety requirements, and as follows:

.1 Single chain operator with inertia brake mechanism capable of locking the shade panel at any point of travel.

.2 Set travel length of chain operator assembly on-site without disassembly of hardware to suit travel length of shade panel.

.3 Chain drive operator shall positively engage drive mechanism through internal profile configuration; friction fitted engagement of the roller tube to drive mechanism will not be acceptable.

.4 Chain operator shall prohibit operation by pulling on hem bar.

.5 Shade roller tube shall be removable from brackets without hardware removal; non-metal components shall be self-lubricating.

2.5 ROLLER SHADE FABRICATION

.1 Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.

.2 Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

.1 Lifting Mechanism: With permanently lubricated moving parts.

.3 Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 23° C:

.1 Shade Units Installed between Inside Jambs: Edge of shade not more than 6 mm from face of jamb. Length equal to head to sill dimension of opening in which each shade is installed.

.4 Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting fascia, roller, and operating hardware and for hardware position and shade mounting method indicated.

.5 Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.

.6 Colour-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

.7 Colours of Metal and Plastic Components Exposed to View: As selected by Consultant from manufacturer's full range

.8 Fasteners:

.1 Non-corrosive as recommended by manufacturer.

2.6 FINISHES

.1 Aluminum: anodized to AA-M12C22A31. Confirm colour with Consultant.

.2 Unexposed aluminum unless otherwise specified: mill finish.

2.7 ACCESSORIES

.1 Aluminum Fascia:

.1 Back / Regular Roll Shade Fascia:

.1 Extruded aluminum alloy 6063-T5, prefinished, 105 mm x 45 mm x 1.6 mm wall thickness, custom designed profile to fit onto premoulded end mounting brackets without exposed fasteners. Colour prefinished to match adjacent window framing or as selected by Consultant.

.2 Fascia shall allow for continuous placement across multiple shades (to a maximum length of 6100 mm without exposed fasteners.

.3 Fascia shall conceal the mounting hardware, power and control cables, drive mechanism, roller tube, and all fabric rolled on the tube.

.4 Fascia shall not fit snug against side channels to prevent thermal shock to the glazing system.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin installation until substrates have been properly prepared.

.2 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

.1 Install shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 50 mm to interior face of glass. Allow proper clearances for window operation hardware.

3.4 ADJUSTING

.1 Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.5 CLEANING

.1 Clean roller shade surfaces after installation, according to manufacturer's written instructions.

3.6 TRAINING

.1 Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.7 PROTECTION

.1 Protect installed products until completion of project.

.2 Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION