



LAKE LOUISE CAMPGROUND TENT SIDE SHOWER BUILDING RENOVATION

Lake Louise, Alberta

Project No.: 113678159

Issued for Tender
December 15, 2017

PROJECT MANUAL

Issued by



Division 01 - General Requirements

01 11 00	Summary of Work
01 14 00	Work Restrictions
01 29 83	Payment Procedures for Testing Laboratory Services
01 31 19	Project Meetings
01 32 16	Construction Schedule
01 33 00	Submittal Procedures
01 35 16	Renovation Project Procedures
01 35 29	Health and Safety Requirements
01 35 43	Environmental Procedures
01 41 00	Regulatory Requirements
01 42 19	Reference Standards
01 45 00	Quality Control
01 51 00	Temporary Utilities
01 52 00	Construction Facilities
01 56 00	Temporary Barriers and Enclosures
01 61 00	Common Product Requirements
01 62 00	Product Options and Substitutions
01 71 00	Examination and Preparation
01 73 00	Execution
01 74 11	Cleaning
01 74 21	Waste Management and Disposal
01 75 00	Starting and Adjusting
01 77 00	Closeout Procedures
01 78 00	Closeout Submittals

Division 02 - Existing Conditions

02 07 25	Cutting and Patching
02 41 20	Selective Demolition

Division 03 – Concrete

03 35 00	Concrete Finishing
----------	--------------------

Division 04 – Unit Masonry

Not Used

Division 05 – Metals

Not Used

Division 06 - Wood, Plastics and Composites

06 10 00	Rough Carpentry
06 20 00	Finish Carpentry
06 40 00	Architectural Woodwork

Division 07 - Thermal and Moisture Protection

07 21 16	Fibrous Insulation
07 27 19	Sheet Membrane Air and Vapour Barrier
07 92 00	Sealants

Division 08 - Openings

Not Used

Division 09 – Finishes

09 21 16	Gypsum Board Assemblies
09 30 13	Tiling
09 91 00	Painting
09 91 90	Re-Painting

Division 10 – Specialties

10 21 13	Toilet Compartments
10 28 10	Toilet and Bath Accessories

END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Bid Package comprises interior renovations to Tent Side Shower Building, located at Lake Louise Campground, Banff National Park, Alberta.
- .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.

1.3 WORK SCHEDULE

- .1 Complete work of this project by May 4, 2018

1.4 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises for Work, for storage, and for access, to allow:
 - .1 Public usage. RV Campground is open during winter.
 - .2 Tent side is separated and only authorized vehicles will have access. Public will not use facilities nearby excluding the nearby Bow River Loop Trail and Tent side cross country Ski Loop.
- .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.

1.5 CONTRACTOR ACCOMMODATIONS

- .1 Contractors can book campsites on RV side (open during winter) at regular cost. Parks Canada can reserve reasonable number of sites (or make sure sites are available) with adequate notice.

1.6 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 their control).
- .3 Schedule of Owner furnished items:
 - .1 Hand Dryers (supplied and installed by Owner)
 - .2 Toilet Paper Dispensers (supplied by Owner and installed by Contractor)
 - .3 Plumbing fixtures (supplied and installed by Owner)
 - .4 Light Fixtures, outlets, occupancy sensors (supplied and installed by Owner)

1.7 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 Use RV side sanitary facilities. Keep facilities clean.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 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.
- .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.

1.5 SPECIAL REQUIREMENTS

- .1 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.

1.6 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is allowed only in areas indicated.

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 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work and at the call of Departmental Representative.
- .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 three 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 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 Interior Architecture (Walls, Floors and Ceiling).
 - .6 Plumbing.
 - .7 Lighting.
 - .8 Electrical.
 - .9 Piping.
 - .10 Controls.
 - .11 Heating, Ventilating, and Air Conditioning.
 - .12 Millwork.
 - .13 Supplied equipment long delivery items.
 - .14 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.
- .20 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

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: Flash Drive
 - .3 Viewpoints: A minimum of four (4) photographs from three (3) different viewpoints will be required.
 - .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.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Cutting: Means removal of existing construction necessary to permit installation or performance of other Work.
- .2 Make Good/Patch/Repair: Means to identify defective or damaged locations, properly prepare identified locations for repairs, and repair (including substrates) using new materials to match construction and finish of adjacent sound locations; blend repaired area smoothly with adjacent construction so that it is not distinguishable from untreated areas in performance or appearance.

1.2 QUALITY ASSURANCE

- .1 Conform to the National Building Code, the Alberta Occupational Health and Safety Act, Regulation and Code, and other applicable standards and regulations.
- .2 Comply with the 'General Demolition Notes' and 'General Notes' on the Contract Drawings.
- .3 Electrical equipment and fixtures shall be CSA approved and carry appropriate CSA label.
- .4 Work performed and materials used in existing building shall be of same standard of quality as that of existing finished building as a minimum, and as otherwise specified (refer to the technical Specification Sections) or indicated on the Drawings.
- .5 Any welding shall be performed by Welders certified in accordance with CSA W47, and shall conform to CSA W59. Provide strict safety measures for welding in existing building. Provide and maintain a fully charged 9.4 kg (20 lbs.) CO₂ fire extinguisher within view and easy access of welding Work at all times.

1.3 BUILDING SECURITY

- .1 The Contractor's forces shall comply with the security requirements of the Owner. Maintain security in a manner acceptable to the Owner throughout the duration of the Contract.
- .2 Hours and days of work at the work site are restricted; comply with the Owner's requirements, policies and procedures throughout the duration of the Contract.
- .3 When working in the building, the Contractor shall engage the services of security personnel if there is not full time supervision by the Contractor.
- .4 The Contractor shall engage services of security personnel if at any time the Owner's security system is compromised by the Work.

1.4 ACCESS

- .1 Coordinate access with the Owner.
- .2 Public and Owner's access to other areas must be maintained at all times.
- .3 Provide and maintain temporary fire exit routing and maintain clear of obstructions during full extent of Contract.

- .4 Contractor's access to Work shall be as agreed by Owner, Contractor, and Departmental Representative.
- .5 Contractor, and construction forces, shall not use any facilities in existing building (washrooms, cafeteria, etc.) without Owner's approval.
- .6 Required exits and exit corridors shall be maintained at all times.
- .7 Protect access ways from damage during Construction. Cover surfaces with polyethylene film and cover with plywood or matting to prevent staining and scarring of existing finishes. Restore damage to condition equal to that prior to damage.
- .8 Where required, provide temporary partitioning or enclosures to maintain or extend emergency and fire exits, and protect areas outside of work areas from dust, fumes and noise.
- .9 Provide and maintain all necessary overhead and other protection as required in public areas during progress of Work.

1.5 SCHEDULING

- .1 Schedule Work and sequence operations in cooperation with Owner and Departmental Representative. Work shall proceed in accordance with agreed upon and approved schedule.
- .2 Utility and service interruptions shall be kept to a minimum and will be permitted only with written permission of Owner. Make requests for service interruptions at least seven days before proposed date. State in request number of hours of interruption. Confirm date and time forty eight hours in advance of interruption.
- .3 Provide two weeks advance notice of entering existing area of Work. Confirm forty-eight hours in advance of starting date.
- .4 Contractor shall request written confirmation from Owner that scheduled areas of Work do not contain any equipment or furnishings that Owner intends to salvage, prior to demolition. The Owner reserves the right of first refusal for all items identified for removal or are otherwise salvageable during demolition operations.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 The Contractor shall provide insulated, air-tight, non-combustible temporary partitioning as required between work and public or occupied areas that ensure contaminants do not spread outside of work areas. Clean corridors daily and use floor mats as required to reduce dust migration into corridors.
- .2 Seal off ducts, louvers, vents, openings, or ceiling spaces between construction area and remainder of building to prevent dust, dirt, contamination, or debris from entering remainder of building.
- .3 Suppress dust and dirt.
- .4 Prevent occurrence of unsanitary conditions, flooding or leaking.
- .5 Do not allow dirt, debris or discarded materials to accumulate on site. Remove promptly each day.
- .6 Keep clean, at all times, those areas adjacent to Work area to prevent dust from entering occupied areas.

- .7 Maintain and keep free of debris, materials and equipment, emergency and fire exits and routes.
- .8 Provide illumination for safe demolition and working conditions, but in any case not less than 275 lx (25 f.c.) in areas where Work is being done.
- .9 Obtain written confirmation from Owner that services to be abandoned, removed or cut have been properly and safely shut off, capped or sealed.
- .10 Take precautions to keep noise and vibration producing activities at a minimum when working within (or on) existing building.
- .11 Dispose of removed material legally. Do not burn on site. Do not allow debris to enter sewers.
- .12 The building is a smoke-free environment. The Contractor will not be allowed to smoke anywhere within the building.

1.7 COORDINATION OF WORK AND NOISE LEVELS

- .1 Work under this contract shall be coordinated with Owner through Departmental Representative. When hours of Work, noise levels or vibration are excessive or detrimental to ongoing operation of existing building complex, an alternate time for such Work shall be scheduled through Departmental Representative.
- .2 Notify Departmental Representative prior to commencing any Work that will cause undue noise or vibration.
- .3 Obtain permission from Departmental Representative prior to drilling holes or cutting chases or openings in floors or ceilings, columns or walls.

1.8 WORK AREAS

- .1 Limits of Work are as indicated on drawings. Work and operation of machinery, storage of equipment, and materials and/or supplies, must be contained within areas under construction.
- .2 All damage caused to existing roads, lanes, paving, curbs, buildings, and equipment due to Work of this Contract, but not called for as Work under this Contract, shall be made good by Contractor at no additional cost to Owner.
- .3 Contact Owner's representative and arrange for sign in/sign out procedure with authorized personnel to obtain keys as required, if requiring access to locked areas during construction; Return keys at end of Work period.
- .4 Contractor shall post boundaries of working areas with suitable signs, warning own forces that areas outside of designated Work areas are out of bounds to personnel and equipment. These signs are to remain in place at all times during construction.
- .5 Existing protected areas and other areas outside limits of Work area are out of bounds to personnel and equipment. These areas are not to be used for any other purpose.
- .6 If revision to limits of working area becomes necessary for any compelling reason, contact Departmental Representative immediately and do not disturb additional area without authorization from Departmental Representative

1.9 EQUIPMENT

- .1 Provide equipment required for safe and proper work.

1.10 PREPARATION

- .1 Confirm that Owner has removed equipment and furnishings to be salvaged in accordance with agreed schedule.
- .2 Provide shoring and bracing as needed to keep building structurally secure and free of deflection in all its parts, and as needed for installation of new structural members.

1.11 PROTECTION

- .1 Protect remaining finishes, equipment, and adjacent Work from damage caused by cutting, moving, removal, and patching operations. Protect surfaces that will remain a part of finished Work.
- .2 Protect existing and new Work from weather during cutting, moving, removal, and construction. Provide weather protection and other facilities and protection as needed to prevent damage to new Work and to remaining old Work.
- .3 When using a cutting torch to remove existing framing provide flameproof screening around area of Work and cover floor area with minimum 6 mm (¼") plywood having joints taped. Allow no sparks or welding or cutting spatter to fall or hit any material or finish that may be damaged or marred.
- .4 Provide protection to existing fans, motors and equipment from construction materials, dirt, dust, debris, moisture, and weld spatter.

1.12 SELECTIVE DEMOLITION

- .1 Cutting, removing and demolition shall be performed to avoid cutting or removing more than is necessary and avoid damaging adjacent construction.
- .2 Do not let piled material or unsanitary conditions create or endanger a structure or persons at any time.
- .3 Where any material, component, assembly or item is indicated for re-use, removal shall be by a trade that normally provides or installs such an item. Items being re-used are to be carefully stored in a protected area until they are to be re installed.
- .4 Items indicated for salvage are to be turned over to the Owner at a location on site as directed by the Owner and will remain property of the Owner.
- .5 Where demolition Work involves cutting into any part of building structure, and materials or finishes that are to be extended, modified or joined to new Work, cutting shall be performed by the trades whose Work is encountered.
- .6 Cut out and remove those assemblies, materials, items indicated for removal on the Drawings and remove from site.
- .7 Coordinate with Division 02 and Drawings for more detailed requirements.

1.13 PATCHING, EXTENDING AND MATCHING

- .1 Patch and extend existing Work using skilled mechanics that are capable of matching existing quality of workmanship. The quality of patched or extended Work shall not be less than that specified in the technical specification Sections.
- .2 In areas where any portion of an existing finished surface is damaged, lifted, stained or otherwise made or found to be imperfect, patch or replace imperfect portion of surface with material matching adjacent sound surfaces.
- .3 Do not incorporate salvaged or used material in new construction except where specified or where small quantities of finish materials that are difficult to match or duplicate are approved for patching or extending purposes by the Departmental Representative.
- .4 Provide adequate support or substrate for patching of finishes.
- .5 If surface found to be imperfect was painted or coated, repaint or recoat complete room. Confirm with Departmental Representative.
- .6 If surrounding surface cannot be matched, repaint or recoat entire surface.
- .7 Patch and repair existing wall junctions where one wall is removed and others remain.
- .8 Where new gypsum board on metal stud construction is to align with existing construction (either plaster on concrete block or gypsum lath or existing gypsum board partitions) align construction to so there is no discontinuity between surfaces.
- .9 Skim coating:
 - .1 Apply skim coating to new and existing gypsum board to areas scheduled for eggshell, semi-gloss or high gloss paints and to corridor walls and any other walls over five metres in length.
 - .2 After normal drywall finishing, but prior to priming or sealing, joints and fastener heads should be lightly sanded using a 220 mesh open weave silicon carbide sanding cloth, or wiped lightly with a damp sponge, to leave a smooth even surface covering joints and fastener heads. Caution must be taken not to raise nap of paper if sanding.
 - .3 Mix joint compound slightly thinner than for joint taping, and apply a thin coating to entire surface with a trowel or drywall broad knife. Immediately wipe back to remove compound that is in excess of amount needed to fill texture differences and minor imperfections, and to eliminate laps or tool marks.
 - .4 When skim coat is completely dry, any minor ridges shall be removed by light sanding or by wiping lightly with a damp sponge.
- .10 Where existing floor-mounted plumbing fixtures are to be removed, remove piping and fill in existing concrete slab to match existing as specified in Division 03.
- .11 Where new finishes are called for and existing finishes are other than paint, remove existing finishes. If in doubt, verify with Departmental Representative prior to removal. This shall include removal of existing corner guards. Repair and make good substrate prior to installing new finishes.

1.14 REPAIR

- .1 Repair Work damaged in course of renovations, except at areas accepted otherwise by Departmental Representative for other remedial action.
- .2 Where full removal of extensive amounts of almost suitable Work would be needed to replace damaged portions, then filling, straightening, spackling and similar repair techniques, followed by full painting or other finishing, may be permitted by Departmental Representative.
- .3 Examples of Work that may frequently be approved by Departmental Representative for repair, rather than replacement: slightly bent ceiling runners, hairline cracks in gypsum board.
- .4 If repaired Work is not brought up to standard for new Work, Departmental Representative will direct that it be cut out and replaced with new Work.

1.15 RELOCATION OF EXISTING EQUIPMENT AND FURNITURE

- .1 At the Owner's discretion, selected existing furniture and equipment items shall be temporarily removed, stored, and then relocated and reinstalled where directed by the Departmental Representative, including fastening to floor and wall substrates as required to ensure that they safely and properly function and operate as intended, including any utility hook-ups and connections that may be required.
- .2 Coordinate as required to ensure that salvaged equipment and furniture is protected during the work and relocated where required by the Owner, fully functioning, clean, and in same or better condition as found at commencement of the project.
- .3 This item shall be paid through Change Directive and Change Order means, pursuant to the terms and conditions of the Contract.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

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 Code 2009.

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] [Trade Contractors], 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 and the Owner's representative are adequately protected.
- .5 Provide training and instruction to occupants of adjacent buildings being added to or renovated, and forming a part of the work of this Contract, about the dangers involved with entering the work site prior to working on site:
 - .1 Provide educational materials, brochures or pamphlets as a part of the training session.
 - .2 Provide training sessions prior to the start of work, to verify that knowledge of construction site hazards is reinforced and maintained.
- .6 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 FIRES

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

1.3 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.

1.4 DRAINAGE

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways or drainage systems. Migration to water retention pond is allowed.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 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.

1.6 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.

1.7 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.

1.8 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 National Building Code 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

- A. 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.
- B. 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 Contractor 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.
- C. 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.
- D. Applicable portions of Standards used that are not in conflict with the Contract Documents are hereby made a part of the Specifications.
- E. Modifications or exceptions to Standards shall be considered as amendments, and unmodified portions shall remain in full effect.
- F. In cases of discrepancies between the Specifications and Standards, the requirements of the Specification shall govern.
- G. In cases of discrepancies between Codes and the Specifications, the Code requirements shall govern.
- H. 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.
- I. 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 Alberta 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 Alberta 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":
 - a. Country of testing origin does not prejudice the acceptability of the listed standards.
 - b. All standards listed in the technical specifications are listed alphabetically, with no preference for country of origin.
- B. 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.
- C. 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.
- D. 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

- A. 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
- B. 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 “cUL_{US}” will be acceptable for use on this project. Systems indicating “UL” or “UL_{US}” 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 “cWHI_{US}” will be acceptable for use on this project. Materials bearing a “WH”, “WHI” or “WHI_{US}” 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

- A. 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
Alberta Building Code	ABC
Alberta Floor Covering Association	AFCA
Alberta Roofing Contractors Association	ARCA
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

Name of Association	Abbreviation
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
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 Departmental Representative 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 Construct in locations acceptable to Departmental Representative or as specified in specific Section.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 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.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.
- .7 Mock-ups may remain as part of Work.
- .8 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 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 WATER SUPPLY

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

1.5 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel. Owner will provide propane and power.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building, not to be used when available.

- .7 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.
- .8 Pay costs for maintaining temporary heat, when using permanent heating system
- .9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 TEMPORARY POWER AND LIGHT

- .1 Owner will provide for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.
- .2 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- .4 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.

1.7 TEMPORARY COMMUNICATION FACILITIES

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

1.8 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 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.
- .3 Clean runways and taxi areas where used by Contractor's equipment.

1.8 OFFICES

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

1.9 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.

1.10 SANITARY FACILITIES

- .1 Use RV side washrooms during construction, keep clean.
- .2 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Departmental Representative.

1.11 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 and Contractor.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.
- .4 Locate project identification sign where indicated 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.

1.12 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.

1.13 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 NOT USED

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.

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 pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .4 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 ACCESS TO SITE

- .1 Parks Canada will provide and maintain access roads, and crossings as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

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

1.8 FIRE ROUTES

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

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.10 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.

1.11 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 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.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 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 This section indicates the criteria for use of optional products listed in the specification and provision for proposing changes to acceptable materials listed during the Bid Period and during the course of construction.

1.2 RELATED SECTIONS

- .1 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 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.

1.2 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.

1.3 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.

1.4 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.

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 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 equipment and fixtures to sanitary condition.
- .18 Clean mechanical equipment including replacement of filters in accordance with Section 01 47 18 – Indoor Air Quality.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 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 Recycle metals and any other items that are accepted at recycling facility. Provide way bills to Departmental Representative.
- .2 Prior to start of Work conduct meeting with Departmental Representative to review and discuss Waste Management Plan and Goals and prepare a waste management plan.
- .3 Waste Management Goal: as much as possible 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.

1.2 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Inert Fill: inert waste - exclusively asphalt and concrete.
- .3 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .4 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 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.
- .6 Separate Condition: refers to waste sorted into individual types.
- .7 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

1.3 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to recycled and salvaged are to be removed from site to recycling facility without storing on site. Materials to be recycled on site are to be placed in final location with minimum of rehandling. Stockpiles of concrete in areas other than final buried location will not be permitted.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Separate recyclable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility. Transport and deliver recyclable items to recycling facilities.
- .4 Protect surface drainage, mechanical and electrical from damage and blockage.
- .5 Separate and store materials produced during dismantling of structures in designated areas.
- .6 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.

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

1.5 USE OF SITE AND FACILITIES

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

1.6 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 APPLICATION

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

3.2 CLEANING

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

- .1 On-site sale of recyclable materials is not permitted.

**3.4 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY
FOR THE ENVIRONMENT**

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

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.

1.2 RELATED SECTIONS

- .1 Section 01 77 00 – Closeout Procedures

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 Owners 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 Owners 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 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.

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. 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 Construction 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 Consultant'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 Consultant, two final copies of operating and maintenance manuals in English along with pdf version on a flash drive 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 Consultant 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 Consultant and Contractor with name of responsible parties.

- .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to 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 Consultant 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 Consultant.

1.5 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of drawings, and in copy of Project Manual, provided by Consultant.
- .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 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 Additional requirements: as specified in individual specification sections.

1.7 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.

1.8 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 Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.9 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 Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.10 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 Consultant. Include approved listings in Maintenance Manual.

1.11 STORAGE, HANDLING AND PROTECTION

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

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

1.12 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant 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 Consultant 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 Consultant.
- .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 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.
- .3 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- .4 Procedure and status of tagging of equipment covered by extended warranties.
- .5 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 Consultant to proceed with action against Contractor.

1.13 PRE-WARRANTY CONFERENCE

- .1 Meet with Consultant, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Consultant.
- .2 Consultant 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.

1.14 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Consultant.
- .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 RELATED SECTIONS

- .1 Section 03 35 00 – Concrete Finishing
- .2 Section 09 21 16 – Gypsum Board Assemblies

1.2 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 SUBMITTALS

- .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 Departmental Representative prior to making cuts or modifications.
 - .7 Departmental Representative'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 Departmental Representative'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 smoke seals.
 - .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 Departmental Representative of findings before proceeding with the Work and revise penetration locations as required and directed by Departmental Representative. 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.
 - .1 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.
 - .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.

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 SECTIONS

- .1 Section 01 74 21 – Waste Management and Disposal
- .2 Section 09 21 16 – Gypsum Board Assemblies
- .3 Section 09 30 13 – Tiling
- .4 Division 20 – Mechanical
- .5 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

1.4 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.

1.5 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 Coordination for shutoff, capping, and continuation of utility services.

1.6 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 Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Departmental Representative 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.

1.7 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 Alberta Occupational Health and Safety Act and Regulations.
 - .2 Conform to Workers' Compensation Board Regulations.
 - .3 Conform to Parks Canada bylaws and regulations governing this type of work.

1.8 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

1.9 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 Materials Act be encountered, stop work, take preventative measures, and notify Departmental Representative 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 Concrete Unit Masonry: Lightweight concrete masonry units and mortar, cut and trimmed to fit existing opening to be filled. Provide standard hollow core units, square end units and bond beam units as indicated on drawings.
- .4 Prefinished Sheet Steel: Prefinished sheet steel, colour to match existing radiation cabinets, bent and profiled to match existing radiation cabinets.
- .5 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.
- .6 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 Departmental Representative any materials that appear to be in re-usable condition prior to disposal.
 - .3 Confirm with Departmental Representative 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 Departmental Representative 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 Departmental Representative 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 Departmental Representative.
 - .2 Departmental Representative 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 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 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 or 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.

3.4 PROTECTION

- .1 Take precautions to guard against damage to adjacent work. Be liable for any damage or injury caused.
- .2 Cease operations and notify Departmental Representative if safety or any adjacent work appears to be endangered. Do not resume operations until reviewed with Departmental Representative.
- .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.

3.5 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.

3.6 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 gypsum board walls with gypsum board and steel framing to match existing, skim coat to make wall smooth and even.
- .7 Demolish existing flooring and adhesive remnants as follows:
 - .1 Vacuum existing carpet 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 resilient flooring materials and carpets.
- .8 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.
- .9 Demolish ceiling finishes as indicated on drawings.
- .10 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.
- .11 Patch and repair all walls, floor and ceilings damaged during demolition with material matching adjacent walls, prepare ready for new finishes.
- .12 Patch and repair all mechanical equipment and electrical fixtures damaged or exposed during demolition to match adjacent finished surfaces.

3.7 CORING, DRILLING AND SAW-CUTTING CONCRETE

- .1 Complete an x-ray or 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.

3.8 PATCHING AND REPARING

- .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.

3.9 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 30 13 – Tiling

1.2 REFERENCES

- .1 American Concrete Institute (ACI):
 - .1 ACI 117-10 (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 D1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - .2 ASTM D1752-04a(2013), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .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 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.

1.4 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.

1.5 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.
 - .3 Provide continuous ventilation during and after coating application.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

- .1 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 NXT Level, Laticrete
 - .5 Sikafloor Level 125, Sika Canada Ltd.
 - .6 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 NXT Level, Laticrete
 - .3 Sikafloor Level 25, Sika Canada Ltd.
 - .4 Sure-Flo FT 100, Gemite.
 - .5 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 Seal Hard, L&M Construction Company
 - .5 Sealtight Liqui-Hard, W.R. Meadows
 - .6 Sikafloor 3S, Sika Canada
- .2 Water: potable.

2.5 SEALING COMPOUNDS

- .1 Surface sealer: to CAN/CGSB-25.20, Type 2 - water based, clear.
 - .1 Surface sealers manufactured or formulated with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, hexavalent chromium and their compounds are not acceptable.
 - .2 Surface sealer shall be compatible with the hardener and shall be manufactured by hardener manufacturer.
 - .3 Surface sealer shall have less than 100g/l of VOC in accordance with SCAQMD Rule #1113.

2.6 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 Departmental Representatives 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 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.
- .3 The minimum floor flatness (F_F) required is to CSA-A23.1/A23.2, Table 16, Class A conventional smooth, straight edge tolerance $\pm 8\text{mm}$, overall. F-number F_F20 , F_L15 , Waviness Index SWI 5mm.
- .4 Depress floor slabs where shown and as required for floor finishes.
- .5 Remove any curing agents used during concrete installation a minimum of 28 days prior to installation of flooring materials.
- .6 Use mechanical stripping to remove chlorinated rubber or existing surface coatings.
- .7 Use protective clothing, eye protection, and respiratory equipment during stripping of chlorinated rubber or existing surface coatings.

3.4 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 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 to be covered with 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 Trowel and Fine Broom Finishing:
 - .1 Apply trowel finishing to surfaces where ceramic or quarry tile is scheduled for installation by either thickset or thin-set method.
 - .2 Slightly scarify surface with a fine broom While concrete is still plastic.
 - .3 Finish surfaces to the tolerances indicated above.

3.5 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.

3.6 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.

3.7 PROTECTION

- .1 Protect finished installation in accordance with manufacturer's instructions.

3.8 MAINTENANCE

- .1 Provide training to Owners representative based on written manufacturer's instructions as indicated in Section 01 78 00 – Closeout Submittals.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 28 19 – Sheet Membrane Air and Vapour Barrier
- .2 Section 09 91 00 - Painting

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
 - .2 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .3 ASTM C578-16, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .4 ASTM C954-15, 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
 - .5 ASTM D1761-12, Standard Test Methods for Mechanical Fasteners in Wood.
 - .6 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
- .2 American Wood Preservers Association (AWPA):
 - .1 AWPA Book of Standards, 2016
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA O112 Series-M1977 (R2006), CSA Standards for Wood Adhesives.
 - .4 CSA O121-17, Douglas Fir Plywood.
 - .5 CSA O141-05 (R2014), Softwood Lumber.
 - .6 CSA O151-17, Canadian Softwood Plywood.
 - .7 CSA O153-13, Poplar Plywood.
 - .8 CAN/CSA-O325-16, Construction Sheathing.
- .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.

1.3 DEFINITIONS

- .1 For the purpose of this project the following definitions shall apply:
 - .1 Structural Light Framing: All horizontal and vertical load bearing framing including members indicated as “Studs” on the drawings shall be considered to be No. 2 Grade and better and shall be used throughout unless prior approval is provided by the Departmental Representative.
 - .2 Stud Framing: Vertical framing members of non-load bearing wall systems may be considered as No. 3 or Stud Grade and may only be used where the Departmental Representative gives prior approval. Use of No. 3 and Stud Grade framing material will not be allowed for any horizontal applications.

1.4 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.

1.5 QUALITY ASSURANCE

- .1 Lumber shall be graded and stamped by an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood panels in accordance with CSA and ANSI standards.

1.6 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.

1.7 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 LUMBER

- .1 Lumber: Stud Grade to CAN/CSA-O141, softwood, S-P-F, S4S, graded and stamped in accordance with National Lumber Grading Association (NLGA) Standard Grading Rules for Canadian Lumber and as follows:
 - .1 Moisture Content: maximum 19% at time of installation.
 - .2 Maximum moisture content when used for attachment of drywall: 16%.
 - .3 Meeting requirements of the Building Code.

2.2 PANEL MATERIALS

- .1 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 Plywood panels to CSA O325, thickness as indicated on drawings.

2.3 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.

2.4 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 AWWA.
- .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/m³. 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/m³
- .5 Complete fabrication of treated items before treatment where possible. If cut after treatment apply field treatment to cut surfaces.
- .6 Wood Preservatives: Maximum allowable VOC limit 350 g/L in accordance with SCAQMD Rule #1113 - Architectural Coatings.

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: 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, recommended for purpose by manufacturer.
- .7 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.
- .8 Expanding foam sealant:
 - .1 Acceptable Materials:
 - .1 GREAT STUFF PRO™ by Dow Canada
 - .2 Hilti (Canada) Ltd. CF Filler Foams.
 - .3 Approved alternates.

2.6 FASTENER FINISHES

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for interior highly humid areas, pressure-preservative, and fire-retardant treated lumber.

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 wall sheathing in accordance with manufacturer's printed instructions.
- .7 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.
- .8 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .9 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.2 WOOD FRAME CONSTRUCTION

- .1 Space framing members at 305 mm o/c, or as indicated otherwise on drawings. Construct members of continuous pieces of longest possible length.
- .2 Provide 38 x 89 mm blocking at 610 mm o/c between engineered floor joists for lateral support of wall plates where walls run parallel to joists.
- .3 Make allowance for erection stresses. Securely brace members in place to maintain plumb and true until permanently fixed and held to structure.
- .4 Install fire-blocking as detailed.
- .5 Fabricate wood frame construction to the requirements of the Building Code, Part 9, except where more stringent requirements are indicated on the drawings.
- .6 Minimum sizes and spacing of members, thickness of materials, allowable species and lumber grades, shall meet the requirements of the above noted standards, unless indicated or specified otherwise.
- .7 Minimize cutting of framing members for pipes, etc. by prior consultation with other trades. Cutting limitations in accordance with Part 9 of the Building Code.
- .8 Construct framing as necessary to accommodate the work of other trades.

3.3 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.

3.4 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 INTENT

- .1 The work of this section includes the supply, fabrication, and delivery to the job site finishing, and installation of site manufactured finish carpentry indicated on the drawings and as specified.
- .2 Finish carpentry work shall include all clear, kiln dried, dressed, or resawn material exposed to view in a finished building interior and exterior, including running and standing trim, wall bases, door frames, panelling, trim and other trim related products.

1.2 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 09 91 00 - Painting

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
 - .2 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 AWMAC Architectural Woodwork Standards, most recent edition.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .2 CAN/CSA O141-05 (R2014), Softwood Lumber.
 - .3 CSA Z760-94 (R2001), Life Cycle Assessment.
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2007.
- .5 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 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures
 - .1 Indicate details of construction, profiles, jointing, fastening and other related details.

- .2 Indicate materials, thicknesses, finishes and hardware.
- .2 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Submit samples, 300 mm x 300 mm of each wood species to receive finish, to the Departmental Representative for review.
 - .2 Submit 250 mm long samples of each type of trim, moulding and handrail.
 - .3 Reviewed samples shall become the standard for the work.
- .3 Closeout Submittals:
 - .1 Provide operations and maintenance data in accordance with Section 01 78 00 – Operation and Maintenance Manuals.

1.5 QUALITY ASSURANCE

- .1 Architectural Woodwork Standards (AWS) published by the Architectural Woodwork Manufacturers Association of Canada, together with authorized additions and amendments will be used as a reference standard and shall form part of this project specification. Where differences occur between the drawings and specifications requirements and the AWS, the more restrictive requirement shall prevail.
- .2 Any reference to Custom or Premium grade in this specification shall be as defined in the AWS.
- .3 Any item not given a specific quality grade shall be Premium grade as defined in the AWS.
- .4 A copy of the AWS shall be made readily available for reference purposes on the job site.
- .5 References in this specification to part and item numbers mean those parts and items contained within the AWS.
- .6 Materials and installation shall be in Metric measurements as specified.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 The Architectural Woodwork Manufacturer and the Contractor shall be jointly responsible to make certain that architectural woodwork is not delivered until the building and storage areas are sufficiently dry so that the architectural woodwork will not be damaged by excessive changes in moisture content.
- .2 Architectural woodwork delivery, storage and handling shall be in accordance with Section 2 Care and Storage of the AWS.
- .3 Delivered materials which are damaged in any way or do not comply with these specifications will be rejected by the Departmental Representative and shall be removed from the job site and replaced with acceptable materials.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

1.8 PROJECT CONDITIONS

- .1 Environmental Conditions: Comply with the AWS Section 2 – Care & Storage for optimum temperature and humidity conditions for woodwork during its storage

and installation. Do not install woodwork until these conditions have been attained and stabilized.

1.9 COORDINATION

- .1 Coordinate provision of concealed blocking or supports.
- .2 Ensure that back-priming of finish carpentry surfaces concealed after installation, has been performed as specified in Section 09 91 00 – Painting, prior to installation.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 Softwood lumber: unless specified otherwise, spruce-pine-fir species, S4S, average moisture content of 6% and maximum of 9% for interior work, an average moisture content of 12% and maximum of 15% for exterior work, in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWS custom grade, moisture content as specified.

2.2 ACCESSORIES

- .1 Fasteners: to suit size and nature of components being fastened.
- .2 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .3 Wood screws: plain, type and size to suit application.
- .4 Splines: wood.
- .5 Adhesive: recommended by manufacturer.
 - .1 Adhesives: maximum VOC limit 30 g/L in accordance with SCAQMD Rule 1168 - Adhesives and Sealants Applications.

2.3 SITE FABRICATION

- .1 Fabricate items rigid, plumb and square, as detailed, with tight, bevelled, hairline joints. Sand work smooth, set all nails and screws.
- .2 Countersink bolts and washers, fill holes with matching wood plugs.

Part 3 Execution

3.1 EXAMINATION

- .1 Contractor, Owner, and Departmental Representative to visit site at 80% completion and note state of Work and finishes in the various areas in which cabinet and millwork to be installed.
- .2 Ensure surfaces are ready to receive Work. All surfaces of other Work to be finished and painted before being built-over or covered in any way or millwork installed.

3.2 INSTALLATION

- .1 Do finish carpentry to Quality Standards of the AWS, except where specified otherwise.
- .2 Scribe and cut as required to fit abutting walls, and surfaces, to fit properly into recesses and to accommodate intersecting or penetrating objects; secure materials and components in place, rigid, plumb and square, with tight, hairline joints to locations indicated on Drawings and in accordance with AWS, and as follows:
 - .1 Form joints to conceal shrinkage
 - .2 Set finishing nails to receive filler
 - .3 Countersink screws in round cleanly cut hole and plug with wood plug matching material being secured

3.3 CONSTRUCTION

- .1 Fastening:
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
 - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Standing and running trim:
 - .1 Install door and window trim in single lengths without splicing.
- .3 Interior and exterior frames:
 - .1 Set frames with plumb sides, level heads and sills, and secure.

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 SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 06 20 00 – Finish Carpentry
- .3 Section 08 14 16 – Wood Doors
- .4 Section 09 21 16 – Gypsum Board Assemblies
- .5 Section 09 65 00 – Resilient Flooring
- .6 Section 09 91 00 – Painting
- .7 Section 10 28 10 – Toilet and Bath Accessories
- .8 Division 22 Mechanical: Sinks in countertops

1.3 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/NPA A208.1-2009, Particleboard.
 - .2 ANSI A208.2-2009, Medium Density Fiberboard (MDF) for Interior Applications.
 - .3 ANSI/HPVA HP-1-2009, Standard for Hardwood and Decorative Plywood.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D2555–16, Standard Practice for Establishing Clear Wood Strength Values.
 - .2 ASTM D2559–12ae1, Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions.
 - .3 ASTM D2832-92(2016), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
 - .4 ASTM D3930–08(2015), Standard Specification for Adhesives for Wood-Based Materials for Construction of Manufactured Homes.
 - .5 ASTM D4300-01(2013), Standard Test Methods for Ability of Adhesive Films to Support or Resist the Growth of Fungi.
 - .6 ASTM D5116-10, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
 - .7 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

- .2 Sustainable Architectural Woodwork (SAW) Certification Manual (2012).
- .4 Canadian Standards Association (CSA International)
 - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
 - .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 (R2013), Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure), Includes Update No. 1 (2010), Update No. 2 (2010).
 - .4 CSA O121-08 (R2013), Douglas Fir Plywood, Includes Update No. 1 (2013).
 - .5 CSA O141-05 (R2014), Softwood Lumber.
 - .6 CSA O151-17, Canadian Softwood Plywood.
 - .7 CSA O153-13, 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 SUBMITTALS

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

- .1 Submit two (2) finished samples, 610 mm x 610 mm of each finish to be applied at the factory, to the Departmental Representative 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 Departmental Representative for approval.
- .3 Reviewed samples shall become the standard for the work.
- .3 Closeout Submittals:
 - .1 Project Record Sheet: Submit to the Departmental Representative two (2) copies of the project record sheet identifying the project title and address, Owner, Departmental Representative, 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.

1.5 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 Premium 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 Materials and installation shall be in metric measurements.

1.6 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

1.7 PROJECT 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.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

1.9 WARRANTY

- .1 Provide manufacturer's standard 10 year warranty for solid surfacing against defects in materials and workmanship; including material and labour to repair or replace defective materials.

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 Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6, without a precoat finish:
 - .1 Colour Basis of Design: as indicated on Drawings.
 - .2 Acceptable Materials:
 - .1 Avonite, Avonite, Inc.
 - .2 Corian, Dupont Polymers.
 - .3 Surell, Formica Corporation.
 - .4 Gibraltar, Wilsonart International.
 - .5 Cambria
- .6 Adhesive:

- .1 Quartz Mounting Adhesive: Provide structural grade '50 year' silicone or epoxy adhesive.
 - .1 Acceptable silicone manufactures:
 - .1 Dow Corning.
 - .2 GE Sealants.
 - .2 Acceptable epoxy manufactures:
 - .1 Cambria Two Part Acrylic Adhesive.
 - .2 Akemi North America.
 - .3 Bonstone Material Corporation.
 - .4 Tenax USA.
- .2 Quartz Surface Adhesive:
 - .1 Provide epoxy or polyester adhesive of a type recommended by manufacturer for application and conditions of use.
 - .2 Adhesive which will be visible in finished work shall be tinted to match quartz Surface.
- .7 Sealant: in accordance with Section 07 92 00 – Sealants.

Part 3 Execution

3.1 JOB CONDITIONS

- .1 Job Conditions for installation of architectural woodwork shall be in accordance with applicable AWS requirements.

3.2 INSPECTION

- .1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Departmental Representative. 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 AND CLEANING

- .1 During and after installation adjust all hardware and operating parts as necessary to ensure smooth and proper operation.
- .2 Clean all cabinet, countertops, shelves and fixtures.
- .3 Repair any marks, scratches or marring.
- .4 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 27 19 – Sheet Membrane Air and Vapour Barrier
- .3 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C167-15, Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.
 - .2 ASTM C553-13, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .3 ASTM C665-12, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .4 ASTM C1320-10 (2016), Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
 - .5 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 Canadian Gas Association (CGA)
 - .1 CAN/CSA-B149.1-15, Natural Gas and Propane Installation Code, Includes Update No. 1 (2010).
 - .2 CAN/CGA-B149.2-15, Propane Storage and Handling Code.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-11, Standard Method of Test for 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-S604-2016, Standard for Factory Built Type A Chimneys.
 - .4 CAN/ULC-S702.2-15, Mineral Fibre Thermal Insulation for Buildings, Part 2: Application Guidelines.

1.3 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.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for sealants. Indicate VOC content.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver insulation and accessories in original unopened packaging or cartons bearing manufacturer's seals and labels.
- .2 Store materials under cover on raised platforms, away from moisture. Keep dry at all times.

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 MANUFACTURERS

- .1 Acceptable Manufacturers: Subject to compliance with requirements specified in this section and as established by the Basis-of-Design materials, manufacturers offering similar products that may be incorporated into the Work include the following:
 - .1 CertainTeed Corporation
 - .2 Johns-Manville Corporation
 - .3 Knauf Insulation
 - .4 Owens-Corning Canada LP.
 - .5 Roxul Inc.

2.2 BATT INSULATION

- .1 Fibrous Mineral Wool Insulation: non-combustible, stone wool batt insulation to CAN/ULC S702 and as follows:
 - .1 Type: 1
 - .2 Fire performance:
 - .1 .1 Non-combustibility: To CAN/ULC S114.
 - .1 Flame spread: 0.
 - .2 Smoke developed: 5.
 - .2 Surface Burning Characteristics: To CAN/ULC S102.
 - .1 Flame spread: 0.
 - .2 Smoke developed: 0.
 - .3 Density: 32 kg/m³ to ASTM C167
 - .4 Thermal Resistance: nominal RSI of 0.71/25 mm
 - .5 Thickness: as required to fill insulated spaces.

- .6 Basis-of-Design:
 - .1 Roxul Inc., ComfortBatt
- .2 Refer to Section 09 21 16 – Gypsum Board Assemblies for insulation in interior partitions.

2.3 ACCESSORIES

- .1 Insulation clips:
 - .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 Attic Rafter Vents: extruded polystyrene foam vent, moisture and rot resistance and as follows:
 - .1 Size: 572 mm x 1220 mm
 - .2 Air channel depth: 37.5 mm
 - .3 Acceptable Materials:
 - .1 ADO, Durovent
 - .2 Owens-Corning Canada LP., Raft-R-Mate
- .3 Eave Ventilation: Preformed, rigid fibreboard or plastic sheets designed and sized to fit between roof framing members, and to provide cross ventilation between insulated attic spaces and vented eaves.
- .4 Nails: galvanized steel, length to suit insulation plus 25 mm, to ASTM F1667.
- .5 Staples: 12 mm minimum leg.
- .6 Tape: as recommended by manufacturer.

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 PREPARATION

- .1 Verify all in-wall construction is complete before beginning installation.
- .2 Install insulation after building substrate materials are dry.
- .3 Ensure substrate materials are properly installed and complete before beginning installation.

3.3 INSTALLATION

- .1 Install batts between framing members, structural components and other items snug and tight.
- .2 Cut and trim batts neatly to fit spaces. Use batts free from ripped or damaged back and edges.
- .3 Do not compress insulation to fit into spaces.

- .4 Install batt insulation where indicated with continuous vapour retarder on the warm side of the insulation in accordance with ASTM C1320.
- .5 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .6 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.
- .7 Fill stud space of exterior framed walls with insulation full depth of stud only where no insulation/vapour retardant indicated on exterior face of stud walls.
- .8 Hold insulation in position with clips, wires or as recommended by manufacturer when insulation is installed in horizontal locations.
- .9 Do not enclose insulation until it has been reviewed by Departmental Representative.
- .10 Installation of Attic Rafter Vents:
 - .1 Install in accordance with manufacturer's written instructions.
 - .2 Install in each rafter or truss space beginning at soffit area and continue up the cavity to the ridge vent or to a common air space.

3.4 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 27 13 – Modified Bituminous Air and Vapour Barrier
- .3 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E96/E96M-16, Standard Test Methods for Water Vapor Transmission of Materials.
 - .2 ASTM E154-08a(2013)e1, Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
 - .3 ASTM E1643-11(2017), Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - .4 ASTM E1677-11, Standard Specification for an Air Barrier (AB) Material or System for Low-Rise Framed Building Walls.
 - .5 ASTM E1745-11, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - .6 ASTM E2178-13, Standard Test Method for Air Permeance of Building Materials.
 - .7 ASTM E2357-11, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
 - .8 ASTM F1249-13, Standard Test Method for Water Vapour Transmission Rate through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
- .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB 51.32-M77, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordination between all installers of each component of vapour and air retarder system is essential to ensure continuity of system and that junctions between the various components are effectively sealed.
 - .2 Verify with manufacturers and all tradesmen involved with installation procedures of building products incorporated into vapour and air retarder elements including, but not limited to, various membranes, coatings and sealants as well as continuity with roofing membrane.

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittals Procedures.
 - .1 Submit manufacturer's printed product literature, specifications and data sheet for each product specified.
 - .2 Submit manufacturer's installation instructions including joint treatment recommendations.

1.5 MOCK-UP

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct typical exterior wall panel, 3 m long by 4 m wide, incorporating window openings with frame and sill installed, insulation, building corner condition, junction with roof system; illustrating materials interface and seals.
- .3 Locate where directed by Departmental Representative.
- .4 Mock-up may remain as part of Work.
- .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with air/vapour barrier work.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Store materials in clean, dry area in accordance with manufacturer's instructions.
- .3 Protect materials during handling and application to prevent damage.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 VAPOUR BARRIER SHEET MATERIALS

- .1 Plastic Sheet Vapour Retarder (Exterior Stud Walls): 6 mil polyethylene sheet meeting requirements of CAN/CGSB-51.34.

2.2 ACCESSORIES

- .1 Accessory Materials: Provide manufacturer's required seam tape, pipe boots and vapour proofing mastic forming a complete system in accordance with CAN/CSA A23.1 and ASTM E1643
- .2 Seam Tape: High density, air resistant polyethylene tape with pressure sensitive adhesive. Type as recommended by vapour retarder manufacturer. Minimum 100 mm for lap joints and perimeter seals, 50 mm wide elsewhere.
- .3 Sealant: Asbestos free non-hardening sealant, compatible with vapour retarder materials, recommended by vapour retarder manufacturer in accordance with Section 07 92 00.

- .4 Fasteners: Provide non-corrosive metal screws, nails, plastic clips and other fasteners as recommended by air/vapour retarder manufacturer required for complete installation of Work.
- .5 Staples: minimum 6 mm leg.
- .6 Moulded Box Vapour Retarder: Factory moulded polyethylene box purpose made for use with recessed electric switch and outlet device boxes.

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 to receive membrane. Notify Departmental Representative if surfaces are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.3 INSTALLATION: SHEET VAPOUR BARRIER

- .1 Verify that services are installed and have been accepted by the Departmental Representative and Authorities Having Jurisdiction prior to installation of vapour retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall, ceiling, and floor assemblies prior to installation of gypsum board to form continuous retarder in accordance with manufacturers written instructions.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Install materials in a manner that maintains continuity; repair punctures and tears with sealing tape before work is concealed.
- .5 Openings:
 - .1 Cut sheet vapour retarder to form openings and lap and seal to window and door frames in accordance with good building envelope practice.
- .6 Seal perimeter of sheet vapour retarder as follows:
 - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Install staples through lapped sheets at sealant bead into wood substrate.
 - .4 Install sealant bead with no gaps; smooth out folds and ripples occurring in sheet over sealant.
- .7 Seal lap joints of sheet vapour retarder as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.

- .5 Install sealant bead with no gaps; smooth out folds and ripples occurring in sheet over sealant.
- .8 Seal electrical switch and outlet device boxes that penetrate vapour retarder as follows:
 - .1 Install moulded box vapour retarder:
 - .2 Apply sealant to seal edges of flange to main vapour retarder and seal wiring penetrations through box cover.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 40 00 – Architectural Woodwork
- .2 Section 07 27 19 – Sheet Membrane Air and Vapour Barrier
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 09 30 13 – Tiling
- .5 Division 23 - Mechanical

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C919-12, Standard Practice for Use of Sealants in Acoustical Applications.
 - .2 ASTM C920-14a, Standard Specification for Elastomeric Joint Sealants.
 - .3 ASTM D2240-15, 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 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 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. 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 Departmental Representative, 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 3 or more 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.

1.5 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 Departmental Representative. 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 Departmental Representative.

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 Departmental Representative.

- .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 Spectrum 2 Silicone, Tremco Inc.
 - .1 To ASTM C920; type S; grade NS; class 50; use NT, G, and A.
 - .2 Acceptable materials:
 - .1 790 Silicone, Dow Corning.
 - .2 Spectrum 1 Silicone, Tremco Inc.
 - .3 To ASTM C920; type S; grade NS; class 25; use NT, G, and A.
 - .4 Acceptable materials:
 - .1 786 Silicone, Dow Corning.
 - .2 OmniPlus, BASF Sonneborn.
 - .3 SCS1700, General Electric.
 - .4 Tremsil 200, 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-5: Acoustical Sealant; interior, non-skimming, non-hardening, simple component synthetic rubber sealant.
 - .1 Acceptable materials:

- .1 Acoustical Sealant, Tremco
 - .2 Metaseal, Chemtron.
- .5 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 Sonolastic NP 2, BASF Sonneborn.
 - .4 Thioplast 400, Chemtron
- .6 Type S-7: One-component polyurethane sealant; non-sag, for general constructions.
 - .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 Sonolastic NP 1, BASF Sonneborn.
 - .4 Sikaflex 1a, Sika.
 - .5 Mapeflex P1, MAPEI Inc
- .7 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
- .8 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
- .9 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
- .10 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 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/m³ 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.

2.5 COLOURS

- .1 Colours: To match adjacent materials, as selected by Departmental Representative, from manufacturer's standard colour range.

2.6 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.

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.

3.3 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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 00 – Rough Carpentry
- .2 Section 07 21 16 – Fibrous Insulation
- .3 Section 07 27 19 – Sheet Membrane Air and Vapour Barrier
- .4 Section 07 84 00 – Fire Stopping and Smoke seals
- .5 Section 07 92 00 – Sealants
- .6 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 C475/C475M-15, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C514-04(2014), Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C557-03(2017), Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C840-17, Specification for Application and Finishing of Gypsum Board.
 - .5 ASTM C1002-16, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .6 ASTM C1047-14a, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .7 ASTM C1177/C1177M-13, Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .8 ASTM C1178/C1178M-13, Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
 - .9 ASTM C1278/C1278M-07a(2015), Standard Specification for Fiber-Reinforced Gypsum Panel.
 - .10 ASTM C1280-13a, Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
 - .11 ASTM C1396/C1396M-14a, Standard Specification for Gypsum Board.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86., AMEND., Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Surface Burning Characteristics of Building Materials and Assemblies.

1.3 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.

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 ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .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: 1200 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 Mould resistant board: to ASTM C1396/C1396M and as follows:
 - .1 Type: regular and fire resistant.
 - .2 Size: 1200 mm x maximum practical length.
 - .3 Thickness: as indicated on Drawings.
 - .4 Acceptable materials:
 - .1 M2Tech Moisture & Mould Resistant Gypsum Board, CertainTeed.
 - .2 Sheetrock Mold Tough, CGC Inc.
 - .3 ToughRock Mold-Guard, Georgia-Pacific Canada, Inc.
- .3 Cementitious backer board: to ASTM C1325 and as follows:
 - .1 Substrate for ceramic tiles.
 - .2 Size: 1200 mm x maximum practical length.
 - .3 Thickness: as indicated on Drawings.
 - .4 Acceptable materials:
 - .1 Durock, CGC Inc.
 - .2 Wonderboard, Custom Building Products Ltd.

2.3 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 Acceptable materials:
 - .1 Johns Manville, MinWool Sound Attenuation Fire Batts
 - .2 Owens-Corning Canada LP, EcoTouch QuietZone PINK FiberGlas Acoustic Insulation
 - .3 Roxul Inc., Roxul AFB Acoustical Fire Batt.

2.4 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 Departmental Representative 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.

2.5 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, PVC or zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .6 Sealants: in accordance with Section 07 92 00 - Sealants.
- .7 Acoustic sealant: in accordance with Section 07 92 00 – Sealants.
- .8 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.
- .9 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 Interior Mould Resistant Gypsum Board: Fibreglass mesh tape.
 - .3 Tile Backing Panels: As recommended by panel manufacturer.
 - .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
 - .3 Joint Compound for Tile Backing Panels:
 - .1 Gypsum based tile backing board: Use setting type taping and setting type, sandable topping compounds.
 - .4 Joint Compound for Interior Mould Resistant Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - .1 Pre-filling: Setting type joint compound.
 - .2 Embedding and First Coat: Setting type joint compound.
 - .3 Fill Coat: Setting type, sandable topping compound.

2.6 FINISHES

- .1 Paint: in accordance with Section 09 91 00 – Painting.
- .2 Tiling: in accordance with Section 09 30 13 – Tiling.

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 Install work level to tolerance of 1:1200.
- .4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .5 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .6 Furr gypsum board faced vertical bulkheads within and at termination of ceilings.
- .7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .8 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .9 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .10 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .11 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.
- .12 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 wood 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 mould-resistant gypsum board where wall tiles to be applied. Apply mould-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .4 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.
- .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.
- .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 SECTIONS

- .1 Section 03 35 00 – Concrete Finishing
- .2 Section 06 10 00 – Rough Carpentry
- .3 Section 07 92 00 – Sealants
- .4 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
 - .1 ANSI/CTI (Ceramic) A108/A118/A136.1-2013, Specification for the Installation of Ceramic Tile - A Collection of 20 ANSI/CTI A108 Series Standards on Ceramic Tile Installation: A108.1A-C, 108.4 -.13, A118.1-.10, ANSI A136.1.
 - .2 CTI (Ceramic) A118.3-2013, Specifications for Chemical Resistant, Water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1-2013).
 - .3 CTI (Ceramic) A118.4-2012, Specifications for Latex Portland Cement Mortar (included in ANSI A108.1-2013).
 - .4 CTI (Ceramic) A118.5-1999, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1-2013).
 - .5 CTI (Ceramic) A118.6-2013, Specification for Ceramic Tile Grouts (included in ANSI A108.1-2013).
 - .6 CTI/ANSI A137.1-2012, Testing for Dynamic Coefficient of Friction
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C144-11, Standard Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C207-06(2011), Standard Specification for Hydrated Lime for Masonry Purposes.
 - .3 ASTM C847-14a, Standard Specification for Metal Lath.
 - .4 ASTM C979/C979M-16, Standard Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA-A3000-13, Cementitious materials compendium (Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2014), Update No. 2 (2014).
- .5 International Organization for Standardization (ISO)
 - .1 ISO 13007:2014, Classifications for Adhesives and Grouts.
- .6 South Coast Air Quality Management District (SCAQMD), California State

- .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .7 Tile Council of North America (TCNA)
 - .1 2015 TCNA Handbook for Ceramic, Glass, and Stone Tile Installation.
- .8 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09 30 00, 2016-2017, Tile Installation Manual.
 - .2 Hard Surface Maintenance Guide.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Preconstruction Meeting: Arrange a preconstruction meeting in accordance with Section 01 31 19 – Project Meetings attended by Contractor, Departmental Representative, tile installer, tile supplier, and mortar and grout representative to discuss the following:
 - .1 Substrate and backing surfaces flatness requirements.
 - .2 Installation techniques associated with specified materials.
 - .3 Compatibility between specified materials and between adjacent materials.
 - .4 Concerns arising from site conditions.
 - .5 Concerns of installers or suppliers arising from as-constructed conditions.

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittals Procedures:
 - .1 Include manufacturer's information on:
 - .1 Ceramic tile, marked to show each type, size, and shape required.
 - .2 Cementitious backer unit.
 - .3 Dry-set cement mortar and grout.
 - .4 Divider strip.
 - .5 Elastomeric membrane and bond coat.
 - .6 Reinforcing tape.
 - .7 Levelling compound.
 - .8 Latex cement mortar and grout.
 - .9 Commercial cement grout.
 - .10 Organic adhesive.
 - .11 Slip resistant tile.
 - .12 Waterproofing/Crack isolation membrane.
 - .13 Fasteners.
- .2 Submit shop drawings in accordance with Section 01 33 00 – Submittals Procedures:
 - .1 Indicate tile layout, patterns, colour arrangement, perimeter conditions, junctions with dissimilar materials, thresholds, and setting details.
 - .2 Locate and detail movement joints.
- .3 Submit samples in accordance with Section 01 33 00 – Submittals Procedures:

- .1 Tile: Submit actual tile samples illustrating colour, texture, size and pattern for each type of tile specified.
- .2 Grout: Submit manufacturer's full range of colours available for each type of grout specified.
- .3 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
- .4 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

1.5 EXTRA MATERIALS

- .1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed.
- .3 Maintenance material same production run as installed material.

1.6 QUALITY ASSURANCE

- .1 Conform to requirements of Terrazzo, Tile and Marble Association of Canada (TTMAC), Tile Specification Guide 09 30 00, Tile Installation Manual.
- .2 Obtain each type of tile material required from single source. For colour consistency, ensure the supplier has capacity to provide products from the same production run, dye lot, calibre and batch number.
- .3 Obtain setting and grouting materials from one manufacturer to ensure compatibility.
- .4 Installer Qualifications: Specializing in tile work having minimum of 5 years successful documented experience with work comparable to that required for this project. Installer must be registered as a member in good standing with the Terrazzo, Tile and Marble Association of Canada.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in containers with labels legible and intact and grade-seals unbroken.
- .2 Store materials so as to prevent damage or contamination.
- .3 Store materials in a dry area, protected from freezing, staining and damage.
- .4 Store cementitious materials on a dry surface.

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 SITE CONDITIONS

- .1 Surfaces for tile installation must be clean, dimensionally stable, cured, level, plumb and free of contaminants such as oil, sealers and curing compounds.

- .2 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation. Tile and setting material stored at same conditions 48 hours before and 7 days after application.
- .3 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
- .4 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

Part 2 Products

2.1 MATERIALS

- .1 Factory blend tile that exhibits colour variations within the ranges selected and package so tile units taken from one package show the same range in colours as those taken from other packages.
- .2 Provide tile products manufactured in accordance with CAN/CGSB 75.1 or ANSI A108.1 as appropriate to the Basis-of-Design Materials.
- .3 Performance Requirements:
 - .1 Static Coefficient of Friction: Tile installed on walkway surfaces having following values as determined by testing identical products per ANSI A137.1:
 - .1 Level Surfaces: Minimum 0.6 dry.
 - .2 Load-Bearing Performance: Provide installations rated for the following load-bearing performance in accordance with ASTM C627 for ceramic tile installed on walkway surfaces:
 - .1 Extra Heavy: Passes cycles 1 through 14.
 - .3 Floor Level Tolerances: Provide materials to attain floor levelness tolerances required by this Section and as required by TTMAC; calculate quantity of materials based on the difference between the specified tolerance and the initial tolerance specified in Section 03 35 00; measurements will be made in the same manner as used in Section 03 35 00.
 - .1 Large Format Tiles: provide minimum floor flatness of FF50; equivalent to 3 mm with no more than 2 gaps under 3000 mm straightedge measurement.

2.2 FLOOR TILE

- .1 Quarry tile: to CAN/CGSB-75.1, slip resistant, stain resistant, colours, manufacturers, sizes and types as indicated in Finish Schedule on Drawings.

2.3 WALL AND CEILING TILE

- .1 Porcelain tile: to CAN/CGSB-75.1, stain resistant, colours, manufacturers, sizes and types as indicated in Finish Schedule on Drawings.

2.4 MORTAR, GROUT, AND ADHESIVE MANUFACTURERS

- .1 Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following manufacturers:
 - .1 Custom Building Products Ltd.
 - .2 Flextile Ltd.
 - .3 Laticrete International Inc.
 - .4 MAPEI Inc.

2.5 MORTAR AND ADHESIVE MATERIALS

- .1 Mortar to be of the following properties unless otherwise specified:
 - .1 Cement: Grey meeting requirements of CSA A3000.
 - .2 Sand: to ASTM C144, passing 16 mesh.
 - .3 Latex additive: formulated for use in cement mortar and thin set bond coat.
 - .4 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
 - .5 Mortars and Adhesives:
 - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .2 Thin Set Mortar: modified, non-sagging, dry-set lightweight cement mortar with polymer and complying with ANSI A118.4, A118.11 and ISO 13007 C2TES1P1.
 - .1 Acceptable Products:
 - .1 Custom Building Products, ProLite Premium Blend LFT Mortar
 - .2 Flextile Ltd., 66 FlexLite Mortar
 - .3 Laticrete International Inc., 255 Multimax
 - .4 MAPEI Inc, Ultralite Mortar
- .3 Polymer Modified Mortar: Modified non-sagging dry-set cement mortar with polymer for large and heavy tile thin-set applications, complying with ANSI A118.4, A118.11 and ISO 13007 C2TES1P1:
 - .1 Acceptable Products:
 - .1 Custom Building Products, Versabond LFT
 - .2 Flextile Ltd., 56SR Mortar
 - .3 Laticrete International Inc., 4-XLT
 - .4 MAPEI Inc., Ultraflex LFT

2.6 GROUT

- .1 Colouring Pigments:
 - .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
 - .2 Colouring pigments to be added to grout by manufacturer.
 - .3 Job coloured grout are not acceptable.
 - .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.

- .2 Epoxy Grout: Multi-component, factory prepared, 100 percent epoxy resin and hardener with sand or mineral filler material; comply with ANSI A118.3 and ISO 130007 Classification R2/RG/ Classification RD for industrial grade.
 - .1 Colour: Colours to match materials, confirm colour with Departmental Representative prior to ordering.
 - .2 Acceptable Products:
 - .1 CEG-Lite, CEG-IG 100% Solid Commercial Epoxy Grout, Custom Building Products.
 - .2 FlexEpoxy 100 – 100% Solids 2-Component Epoxy Grout, Flextile Ltd.
 - .3 Kerapoxy CQ, Premium Epoxy Mortar and Grout, MAPEI Inc.
 - .4 Latapoxy SpectraLOCK Pro Premium, Laticrete International Inc.
- .3 Grout:
 - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.

2.7 MEMBRANES

- .1 Membrane: rigid polyethylene membrane with a grid structure of square cavities each cut in a dovetail configuration, and an anchoring fleece laminated to underside or non-directional, non-deteriorating woven mat 10 mm thick complete with manufacturers recommended floor adhesives and setting materials:
 - .1 Acceptable materials:
 - .1 Schlüter Ditra
 - .2 Laticrete International Inc. QSM4 Mat
- .2 Crack Isolation Membrane: Sheet membrane
 - .1 Basis-of-Design:
 - .1 Crack Buster Pro Crack Prevention Mat & Peel N Stick Primer, Custom Building Products
 - .2 Flexilastic 1000 Crack Isolation Membrane with 4000 Primer, Flextile Ltd.
 - .3 Fracture Ban, Laticrete International Inc.
 - .4 Mapeguard 2, MAPEI Inc.

2.8 ACCESSORIES

- .1 Trim shapes:
 - .1 Conform to applicable requirements of adjoining floor and wall tile.
 - .2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.
 - .3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.
- .2 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 Sealants: maximum VOC limit 250 g/L to SCAQMD Rule 1168.
- .3 Tile sealer and protective coating: to CAN/CGSB-25.20, Type 1 and to tile and grout manufacturers recommendations.

2.9 PATCHING AND LEVELLING COMPOUND

- .1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.
- .2 Have not less than the following physical properties:
 - .1 Compressive strength - 25 MPa.
 - .2 Tensile strength - 7 MPa.
 - .3 Flexural strength - 7 MPa.
 - .4 Density - 1.9.
- .3 Capable of being applied in layers up to 12 mm thick, being brought to feather edge, and being trowelled to smooth finish.
- .4 Ready for use in 48 hours after application.
- .5 Acceptable materials:
 - .1 59 Flex Flo with 4040 Concrete Primer, Flextile Ltd.
 - .2 CustomTech TechLevel 150 with CustomTech TechPrime A, Custom Building Products
 - .3 Novoplan Easy Plus, MAPEI Inc
 - .4 NXT Level, Laticrete International Inc.

2.10 CLEANING COMPOUNDS

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

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 PREPARATION

- .1 Protect surrounding work from damage or disfiguration arising from work of this Section.
- .2 Surfaces: Thoroughly clean substrate surfaces receiving tile finishes to remove grease, oil or dust films, and other contaminants affecting bond of materials within bonding systems and as follows:
 - .1 Clean back of each tile before installation to remove surface contaminants and cutting residue, firing release dust and other debris detrimental to bond and final surface appearance.

- .3 Surface Levelling: apply self levelling compound to make backing surfaces flat and true to tolerances in plane listed in performance requirements above and as required by TTMAC.

3.3 WORKMANSHIP

- .1 Do tile work in accordance with TTMAC Tile Installation Manual except where specified otherwise.
- .2 Apply tile or backing coats to clean and sound surfaces.
- .3 Back Buttering: Obtain minimum 95% mortar coverage in accordance with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108 series of tile installation standards for the following applications:
 - .1 Tile in wet areas:
 - .1 Showers
 - .2 Tile having tiles 305 mm or larger in any direction.
 - .3 Tile installed with chemical resistant mortars and grouts
 - .4 Tile having tiles with raised or textured backs.
 - .5 Tile having tile installation rated for Heavy or Extra Heavy Duty.
 - .6 All porcelain tiles with more than 20% of the tile backs covered with "white firing release" shall be "back buttered" so that 100% of the back is covered with adhesive mortar rated for C627, Extra Heavy Duty rating.
- .4 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .5 Maximum surface tolerance 1:800.
- .6 Make joints between tile uniform, plumb, straight, true, even and flush with adjacent tile. Confirm joint width with Departmental Representative. Ensure sheet layout not visible after installation. Align patterns.
- .7 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .8 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .9 Make internal angles square, external angles rounded.
- .10 Use round edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
- .11 Install divider strips at junction of tile flooring and dissimilar materials.
- .12 Allow minimum 24 hours after installation of tiles, before grouting.
- .13 Clean installed tile surfaces after installation and grouting cured.
- .14 Locate expansion, control, contraction, and isolation joints, as indicated in the TTMAC Installation manual to suit installation.

3.4 WATERPROOFING AND CRACK SUPPRESSION MEMBRANE INSTALLATION

- .1 Install waterproofing and crack suppression membrane in accordance with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

- .2 Install tiling after liquid applied membranes are cured and tested to confirm that it is watertight.

3.5 WALL TILE

- .1 Install tile on cementitious board to TTMAC details 305W:
 - .1 Install cementitious board to areas listed.

3.6 FLOOR TILE

- .1 Install tile on concrete floor substrates to TTMAC detail 309F, 310F, 311F, as suitable to substrate and application.
- .2 Install large format floor tile in accordance with TTMAC detail 329 LFT

3.7 CEILING TILE

- .1 Install in accordance with TTMAC detail 315C.

3.8 TILE SEALER AND PROTECTIVE COATING

- .1 Apply manufacturer's recommended floor sealer in strict accordance with manufacturer's written instructions for the specific tile type being sealed.
- .2 Apply sealer to tiles before grouting in cases of absorbent biscuit tiles and again after completion and cleaning of grouting process.

3.9 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.

3.10 CLEANING

- .1 On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter using Job Site Cleaner listed above:
 - .1 Remove latex-portland cement and epoxy grout residue from tile as soon as possible.
 - .2 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation.
 - .3 Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.
 - .4 Flush surface with clean water before and after cleaning.
 - .5 Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- .2 Leave finished installation clean and free of cracked, chipped, broken, unbonded, or other tile deficiencies:
 - .1 Protect finished areas from traffic until setting materials have sufficiently cured in accordance with TTMAC requirements.

- .2 Protect floor areas from traffic after grouting is completed in accordance with manufacturer's written instructions.
 - .1 Keep traffic off floors for a minimum of 24 hours after completion of grouting.
 - .2 Use stepping boards where access is required for light foot traffic only after 4 hours from completion of grouting.
- .3 Provide protective covering until Substantial Performance of the Work.
 - .1 Protect wall tiles from impact, vibration, heavy hammering on adjacent and opposite walls for a minimum of 7 days 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 REFERENCE STANDARDS

- .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

1.4 DEFINITIONS

- .1 Gloss Levels: Standard coating terms defined by MPI Manual apply to products of this Section as follows, and are used in Room Finish Schedule to designate required gloss levels for indicated areas:
 - .1 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°.
 - .2 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°.
 - .3 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°.
 - .4 G5 – Semi-Gloss: Medium sheen finish with a gloss range of 35 to 70 when measured at 60° to meter.

1.5 SUBMITTALS

- .1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.

- .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 Departmental Representative 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 Departmental Representative, 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 Departmental Representative:
 - .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.

1.6 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 – Closeout Submittals including specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.

1.7 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.

1.8 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

- .1 Subject to compliance with requirements, manufacturers that have attained the prerequisites for ecologically sustainable labelling mark on their products and may be incorporated into the Work include; but are not limited to, the following:
 - .1 Benjamin Moore and Co. Limited

- .2 ICI Paints (Canada) Inc.
- .3 Para Paints
- .4 PPG Canada Inc.- Architectural Finishes
- .5 SICO Inc.
- .6 Sherwin-Williams LLC

2.2 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 EXTERIOR PAINTING

- .1 Unless otherwise specified, all exterior painting work to be in accordance with MPI Premium Grade finish requirements.
- .2 Concrete Masonry Units: smooth and split face block and brick:
 - .1 EXT 4.2A - Latex semi-gloss level finish.
- .3 Structural Steel and Metal Fabrications: columns, beams, joists and miscellaneous metal:

- .1 EXT 5.1D - Alkyd semi-insert gloss level finish.
- .4 Galvanized Metal: non chromate passivated; high contact/high traffic areas (doors, frames, railings and handrails, etc.):
 - .1 EXT 5.3B - Alkyd semi-gloss level finish.
- .5 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.:
 - .1 EXT 6.3B - Alkyd semi-gloss level finish do not use flat finish on doors.

3.4 INTERIOR SURFACES

- .1 Paint interior surfaces in accordance with the MPI Manual painting systems listed in this section.
- .2 Galvanized Metal (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etcetera):
 - .1 INT 5.3B – Water based light industrial coating semi-gloss finish.
- .3 Dressed Lumber (including doors, door and window frames, casings, mouldings, etcetera):
 - .1 INT 6.3E – Semi-transparent stain / polyurethane varnish satin gloss finish.
- .4 Plaster and Gypsum Board (gypsum board, drywall, and other sheet gypsum materials):
 - .1 INT 9.2B – High performance architectural latex semi-gloss finish.
- .5 Acoustic Panels and Tiles, touch up paint:
 - .1 INT 9.3A – Latex flat finish.

3.5 MAINTENANCE REPAINTING

- .1 Paint existing previously finishes surfaces in accordance with the MPI Manual painting systems listed in this section.

3.6 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 Departmental Representative:
 - .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.

3.7 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.

3.8 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 Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

3.9 CLEANUP

- .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.

END OF SECTION

Part 1 General

1.1 INTENT

- .1 Section includes for labour, materials, tools and other equipment, services and supervision required to complete all interior and exterior repainting work as indicated on the Drawings and Specifications.
- .2 Work listed in this Section includes, but is not limited to, the following:
 - .1 Moisture testing of substrates.
 - .2 Surface preparation of substrates as required for acceptance of paint, including cleaning, small crack repair, patching, caulking, and making good surfaces and areas to the limits defined under MPI Repainting Manual Preparation requirements.
 - .3 Specific pre-treatments noted in this specification or as required by the MPI Repainting Manual.
 - .4 Sealing and priming surfaces for repainting in accordance with MPI Repainting Manual requirements.
 - .5 Provision of safe and adequate ventilation as required where toxic, volatile or flammable materials are being used.
 - .6 High pressure washing and abrasive blasting in accordance with the requirements of Section 03 35 00 – Concrete Finishing

1.2 RELATED SECTIONS

- .1 Section 03 35 00 – Concrete Finishing
- .2 Section 06 20 00 – Finish Carpentry
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 09 91 00 – Painting

1.3 REFERENCES

- .1 American Society of Testing and Materials (ASTM)
 - .1 ASTM D16-16, Standard Terminology for Paint, Related Coatings, Materials, and Applications.
 - .2 ASTM E84-16, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .3 ASTM F1869-16a, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- .2 Environmental Choice Program (ECP):
 - .1 Paints and Surface Coatings, Low VOC Product Listings
- .3 Green Seal
 - .1 Green Seal Standards GS-11, Paint.
 - .2 Green Seal Standard GC-03, Anti-Corrosive Paints.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 Master Painters Institute (MPI)

- .1 Existing Surfaces: Interior and Exterior Maintenance Repainting Manual.
- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-04, Architectural Coatings.
- .7 Society for Protective Coatings (SSPC)
 - .1 Coating Materials Guidelines
 - .2 Surface Preparation Guidelines
 - .3 Application, Inspection and Quality Control Guidelines

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate work of this section with Section 01 50 00 – Temporary Utilities and Section 01 52 00 – Construction Facilities for provision of temporary heat and light, scaffolding and platforms and housekeeping services.
 - .2 Coordinate preparation of substrates with other sections of work for the correction of defects and Degree of Surface Deterioration Level DSD-4 deficiencies listed below that may adversely affect repainting work.
 - .3 Coordinate phasing of the work with the requirements of Sections 01 11 00 – Summary of Work
- .2 Pre-Installation Meeting:
 - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations in accordance with Construction Progress Schedule.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
- .3 Scheduling:
 - .1 Schedule repainting operations to prevent disruption of and by other trades when applicable; do not change work schedule without written acceptance from the Departmental Representative and Owner.
 - .2 Schedule repainting operations to prevent disruption of occupants in and about the building. Obtain written authorization from Departmental Representative/Owner for changes in work schedule.

1.5 SUBMITTALS

- .1 Comply with requirements of Section 01 33 00 – Submittals Procedures.
- .2 Submit list of painting materials to the Departmental Representative for review prior to ordering materials.
- .3 Submit two sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.

- .4 Provide an itemized list complete with manufacturer, paint type and colour coding for all colours used for Owner's later use in maintenance for use in the operations and maintenance manual specified in Section 01 78 00 - Closeout Submittals.

1.6 QUALITY ASSURANCE

- .1 Applicator shall have a minimum of five (5) years proven satisfactory experience and provide proof that a qualified crew of painters will be maintained on the project throughout the duration of the work when requested by the Departmental Representative.
- .2 Applicator shall provide a list of the last three comparable repainting jobs including, name, location, specifying authority or project manager, start and completion dates and value of the work when requested by the Departmental Representative.
- .3 Use only qualified journeyman painters for the duration of the work of this Section; apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations; provide list of journeyman and apprentices working on the site when requested by the Departmental Representative.
- .4 Materials, preparation and workmanship shall conform to the standards contained in the latest edition of the Master Painters Institute (MPI) Maintenance and Repainting Manual (MPI Repainting Manual).
- .5 Paint manufacturer shall provide certification of all surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to the Owner where "special" coatings or decorating systems (i.e.: textured coatings or non-MPI listed products or systems) are used in repainting.

1.7 ENVIRONMENTAL CONSIDERATIONS

- .1 Comply with requirements of Section 01 74 21 - Waste Management and Disposal.
- .2 The following procedures shall be followed to reduce the amount of contaminants entering waterways, sanitary or storm drain systems or into the ground:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

- .6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.
- .3 Collect waste paint by type and provide for delivery to recycling or collection facility where paint recycling is available.
- .4 Comply with requirements of authorities having jurisdiction, in regard to the use, handling, storage and disposal of hazardous materials.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver painting materials in sealed, original labelled containers bearing manufacturer's name, brand name, type of paint or coating and colour designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.
- .2 Store paint materials in original labelled containers in a secure (lockable), dry, heated and well ventilated single designated area meeting the minimum requirements of both paint manufacturer and authorities having jurisdiction and at a minimum ambient temperature of 7°C. Store only materials used on this project on site.
- .3 Provide adequate fireproof storage lockers, take necessary precautions, and post warning signs (i.e.: no smoking) where toxic, volatile, explosive, or flammable materials are being used or stored, as follows:
 - .1 Take necessary precautions and safety measures to prevent fire hazards and spontaneous combustion, and to protect the environment from spills.
 - .2 Materials considered to constitute a fire hazard include, but are not limited to, paints, solvents, drop clothes and similar materials.
 - .3 Storage containers considered as adequate include, but are not limited to; manufacturers original closed and rated containers.
 - .4 Remove empty open containers from the site on a daily basis.
 - .5 Provide adequate storage facilities.

1.9 SITE CONDITIONS

- .1 Perform interior and exterior repainting work only when ambient air and substrate temperatures and humidity level is within the manufacturer's recommended performance range.
- .2 Provide continuous ventilation and sufficient heating facilities to maintain minimum ambient air and substrate temperatures for 24 hours before, during and after paint application.
- .3 Provide supplemental ventilating and heating equipment where ventilation and heating from existing system is not adequate to meet minimum safety and performance requirements; gas fired heating units will not be permitted, unless accepted in writing by the Departmental Representative and authorities having jurisdiction.
- .4 Test substrate surfaces (concrete, masonry, plaster and wood) for moisture and alkalinity using a properly calibrated electronic Moisture Meter, except that concrete floors can be tested using a cover patch test; maximum moisture shall not exceed:

- .1 12% for concrete and masonry (clay and concrete brick, and concrete block), use concrete test ASTM F1869 for concrete floors.
- .2 15% for wood.
- .3 12% for plaster and gypsum board.
- .5 Provide a minimum lighting level of 323 Lux (30 foot candles) on surfaces being repainted.
- .6 Apply paint only to dry, clean, 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.
- .7 Additional exterior application requirements:
 - .1 Perform no exterior repainting work when the ambient air and substrate temperatures are below 10°C.
 - .2 Perform no exterior repainting work unless environmental conditions are within MPI and paint manufacturer's requirements or until adequate weather protection is provided. Where required, provide suitable weatherproof covering and sufficient heating facilities to maintain minimum ambient air and substrate temperatures for 24 hours before, during and after paint application.
 - .3 Perform no exterior repainting work when the relative humidity is above 85% or when the dew point is less than 3°C variance between the air/surface temperature.

1.10 MAINTENANCE MATERIALS

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide a minimum of 1 litres of each type and colour of paint from same production run (batch mix) used in unopened cans, properly labelled and identified for Owner's later use in maintenance.
- .3 Store where directed by the Owner.

Part 2 Products

2.1 MANUFACTURERS

- .1 Subject to compliance with requirements, manufacturers that have attained the prerequisites for ecologically sustainable labelling mark on their products and may be incorporated into the Work include; but are not limited to, the following:
 - .1 Benjamin Moore and Co. Limited
 - .2 ICI Paints (Canada) Inc.
 - .3 Para Paints
 - .4 PPG Canada Inc.- Architectural Finishes
 - .5 SICO Inc.
 - .6 Sherwin-Williams LLC

2.2 MATERIALS

- .1 Materials used for this project shall be listed in the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.
- .2 Materials not listed, such as linseed oil, shellac, turpentine, and similar products shall be the highest quality product of an approved manufacturer listed in the MPI Approved Product List and shall be compatible with other coating materials as required.
- .3 Materials and paints shall be lead and mercury free.
- .4 Only qualified products with E2 "Environmentally Friendly" ratings are acceptable for use on this project, Use E3 rated products where available.
- .5 Paint materials shall have good flowing and brushing properties and shall dry or cure free of blemishes, sags, air entrapment and other effects deleterious to the final finish as noted below.
- .6 Paints and coatings shall meet flame spread and smoke developed ratings designated by local Building Code requirements and authorities having jurisdiction.

2.3 EQUIPMENT

- .1 Painting Equipment: to best trade standards for type of product and application.
- .2 Spray-Painting Equipment: of ample capacity, suited to the type and consistency of paint or coating being applied and kept clean and in good working order at all times.

2.4 MIXING AND TINTING

- .1 Paints shall be ready-mixed and pre-tinted; re-mix paint in containers prior to and during application to break-up of lumps, and provide complete dispersion of settled pigment, and provide consistent colour and gloss.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Thin paint for spraying in strict accordance with paint manufacturer's instructions; where directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.

2.5 FINISH AND COLOURS

- .1 Unless otherwise specified, all repainting work shall be done in accordance with MPI Premium Grade requirements.
- .2 Colours shall match existing or be as selected by the Departmental Representative from a manufacturer's full range of colours
- .3 Access doors, registers, radiators and covers, exposed piping and electrical panels shall be repainted to match adjacent surfaces (i.e. colour, texture and sheen), unless otherwise noted or where pre-finished.

2.6 GLOSS/SHEEN RATINGS

- .1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following MPI gloss / sheen standard values:

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 maximum
G2	Velvet finish	10 maximum	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 minimum
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as indicated.

Part 3 Execution

3.1 CONDITION OF SURFACES

- .1 Prior to commencement of repainting work, thoroughly examine and test conditions and surfaces scheduled for repainting and report in writing to the Departmental Representative any conditions or surfaces that will adversely affect work of this section.
- .2 The degree of surface deterioration (DSD) shall be assessed using the assessment criteria indicated in the MPI Maintenance Repainting Manual as follows:

Condition	Description
DSD-0	Sound Surface (may include visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (may show fading; gloss reduction, slight surface contamination, minor pin holes scratches, etc.)/Minor cosmetic defects (runs, sags, etc.).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, staining, etc.).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required by others).

- .3 Other than the repair of DSD-1 to DSD-3 defects included under this scope of work, structural and DSD-4 substrate defects discovered prior to and after surface preparation or after first coat of paint shall be made good and sanded by others ready for painting, unless otherwise agreed to by the Owner and painter to be included in this Work.
- .4 No repainting work shall commence until all such DSD-4 adverse conditions and defects have been corrected and surfaces and conditions are acceptable to the

Painting Subcontractor. The Painting Subcontractor shall not be responsible for the condition of the substrate or for correcting defects and deficiencies in the substrate, which may adversely affect the painting work except for minimal work normally performed by the Painting Subcontractor and as, indicated herein. It shall always, however, be the responsibility of the Painting Subcontractor to see that surfaces are properly prepared before any paint or coating is applied. It shall also be the Painting Subcontractor's responsibility to paint the surface as specified providing that the owner accepts responsibility for uncorrected DSD-4 substrate conditions.

3.2 PREPARATION OF SURFACES

- .1 Prepare surfaces for repainting in accordance with MPI Repainting Manual requirements, refer to the MPI Repainting Manual for specific requirements for the following:
 - .1 Environmental conditions.
 - .2 pH testing.
 - .3 Acid etching.
 - .4 Rust stain removal.
 - .5 Mildew removal.
 - .6 Clay and concrete masonry units.
 - .7 Structural steel and miscellaneous metals.
 - .8 Steel exposed to high heat.
 - .9 Galvanized and zinc coated metal.
 - .10 Aluminum and copper surfaces.
 - .11 Dimension and dressed lumber.
 - .12 Canvas and cotton coverings.
 - .13 Bituminous coated surfaces.
- .2 Pressure wash exterior surfaces where required prior to repainting in accordance with MPI standards for type of surfaces and recommended pressures to ensure complete removal of all loose paint, stains, dirt, and other foreign matter. Carry out this work only by qualified tradesman experienced in pressure water cleaning. The use of water hose cleaning will not be considered satisfactory, unless specifically specified. Allow sufficient drying time and test all surfaces using an electronic moisture meter before commencing work.
- .3 Sand, clean, dry, etch, neutralize and/or test all surfaces under adequate illumination, ventilation and temperature requirements.
- .4 Remove and securely store miscellaneous hardware, surface fittings and fastenings (i.e.: electrical plates, mechanical louvers, door and window hardware), removable rating, hazard or instruction labels, washroom accessories, light fixture trim, and similar items from wall and ceiling surfaces, and doors and frames, prior to repainting and replace upon completion:
 - .1 Carefully clean and replace removed items upon completion of repainting work in each area.
 - .2 Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (i.e.: lacquer finishes).

- .3 Doors shall be removed before repainting to paint bottom and top edges and then re-hung.
- .5 Protect adjacent surfaces and areas, including non-removable rating and instruction labels on doors, frames, equipment, piping, landscaping, walks, signage, and similar items, from repainting operations and damage by drop cloths, shields, masking, templates, or other suitable protective means and make good any damage caused by failure to provide such protection.

3.3 APPLICATION

- .1 Commence repainting only when substrates are acceptable and environmental conditions (i.e.: heating, ventilation, lighting and completion of other subtrade work, if applicable) are acceptable for applications of products.
- .2 Apply primer, paint or stain in accordance with MPI Painting Manual Premium Grade finish requirements.
- .3 Apply primer, paint or stain in a workmanlike manner using skilled and trade-qualified applicators as noted under Quality Assurance.
- .4 Apply primer, paint or stain within an appropriate time frame after cleaning and preparation to prevent weathering or water staining of substrate when environmental conditions encourage flash-rusting, rusting, contamination or the manufacturer's paint specifications require earlier applications.
- .5 Primer, paint or stain coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.
- .6 Tint each coat of paint progressively lighter to enable confirmation of number of coats.
- .7 The number of coats and film thickness required are the same regardless of application method, except that dark tinted colours will require a minimum of four (4) coats with an additional clear urethane or water based light industrial coating type of coating applied in high traffic areas.
- .8 Sand and dust between each coat to provide an anchor for next coat and to remove defects in previous coat (runs, sags, etc.) visible from a distance up to 1000 mm.
- .9 Do not apply finishes on surfaces that are not sufficiently dry unless manufacturer's directions state otherwise; each coat shall be sufficiently dry and hard before a following coat is applied.
- .10 Apply materials in strict accordance with manufacturer's spread rates and application requirements to avoid air entrapment in applied coats.

3.4 MPI INTERIOR REFINISHING SYSTEMS

- .1 Paint interior surfaces in accordance with MPI Repainting Manual requirements and the systems listed in this Article.
- .2 Concrete Masonry Units: (smooth and split face block and brick):
 - .1 RIN 4.2A - Latex semi-gloss level finish.
- .3 Structural Steel and Metal Fabrications: (columns, beams, joists and miscellaneous metal):

- .1 RIN 5.1E - Alkyd semi-gloss level finish.
- .4 Steel-High Heat: (boilers, furnaces, heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted):
 - .1 RIN 5.2A: Heat resistant enamel finish, maximum 205°C.
 - .2 RIN 5.2B: Heat resistant aluminum paint finish, maximum 427°C.
 - .3 RIN 5.2C: Inorganic zinc rich coating, maximum 400°C.
 - .4 RIN 5.2D: High heat resistant coating, maximum 593°C.
- .5 Galvanized Metal: (not chromate passivated) (for high contact/high traffic and low contact/low traffic areas as noted on doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.):
 - .1 RIN 5.3B - Alkyd semi-gloss level finish.

3.5 MPI EXTERIOR REFINISHING SYSTEMS

- .1 Paint exterior surfaces in accordance with MPI Repainting Manual requirements and the systems listed in this Article.
- .2 Concrete Masonry Units: (smooth and split face block and brick):
 - .1 REX 4.2E – Epoxy, semi-gloss
- .3 Structural Steel and Metal Fabrications: (columns, beams, joists and miscellaneous metal):
 - .1 REX 5.1D - Alkyd semi-gloss level finish.
- .4 Steel - High Heat: (heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted)
 - .1 REX 5.2A: Heat resistant enamel finish, maximum 205°C.
 - .2 REX 5.2B: Heat resistant aluminum enamel finish, maximum 427°C.
 - .3 REX 5.2C: Inorganic zinc rich coating, maximum 400°C.
 - .4 REX 5.2D: High heat resistant coating, maximum 593°C.
- .5 Galvanized Metal: (not chromate passivated) (for high contact/high traffic and low contact/low traffic areas as noted on doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.):
 - .1 REX 5.3B - Alkyd semi-gloss level finish.

3.6 MECHANICAL AND ELECTRICAL EQUIPMENT

- .1 Repainting of mechanical and electrical work shall include exposed to view, previously painted mechanical and electrical equipment and components including, but not limited to, panels, conduits, piping, hangers, ductwork, and similar items.
- .2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with colour, and sheen finish to match existing unless otherwise noted or scheduled.
- .3 Do not paint over nameplates or instruction labels.
- .4 Leave unfinished exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish.

- .5 Keep repainted sprinkler heads free of paint.
- .6 Do not paint interior transformers and substation equipment.

3.7 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, limit or direct traffic away or around work area as required.

3.8 CLEAN-UP

- .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/solvents as well as all other cleaning and protective materials (i.e.: rags, drop cloths, masking papers, etc.), paints, thinners, paint removers/strippers in accordance with the safety requirements of authorities having jurisdiction.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 10 28 10 – Toilet and Bath Accessories

1.2 REFERENCES

- .1 National Building Code 2015 Barrier Free Design Section 3.8
- .2 American National Standards Institute (ANSI)
 - .1 ANSI A208.1-2009, Particleboard.
- .3 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 D1972-97 (2005), Standard Practice for Generic Marking of Plastic Products.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .5 Canadian Standards Association (CSA International)
 - .1 CSA-B651-12, Accessible Design for the Built Environment, Includes Update No. 1 (2007).
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.3 PRE-INSTALLATION MEETINGS

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and Departmental Representative in accordance with Section 01 32 16 - Construction Schedule to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions.

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures:
 - .1 Submit manufacturer's printed product literature for toilet partitions or components, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures:
 - .1 Indicate fabrication details, plans, elevations, hardware, and installation details.
- .3 Submit samples in accordance with Section 01 33 00 – Submittal Procedures:
 - .1 Submit duplicate 300 x 300 mm samples of panel showing finish on both sides, two finished edges and core construction.
 - .2 Submit duplicate representative samples of each hardware item, including brackets, fastenings and trim.
- .4 Manufacturer's Instructions:
 - .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.
- .5 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
- .6 Submit closeout data in accordance with Section 01 78 00 – Closeout Submittals:
 - .1 Provide manufacturer's printed recommendations for general maintenance, including cleaning instructions.

1.5 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.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, handle and store units in accordance with manufacturer's instructions.
- .2 Store units on raised wood pallets protected from the elements and corrosive materials.
- .3 Do not remove from crates or other protective covering until ready for installation.

1.7 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 Subject to compliance with the requirements of this Section and Drawings, manufacturers offering products that may be incorporated into the Work include the following:
 - .1 Global Partitions.

- .2 Bradley Corporation
- .3 GSS (General Storage Systems).
- .4 Hadrian Manufacturing Inc.
- .5 Hovik Industries Ltd.
- .6 Shanahan's Limited.

2.2 MATERIALS

- .1 Toilet Partition Type: Floor Mounted overhead brace partitions.
- .2 Phenolic Toilet Partitions: class A solid phenolic with resin impregnated kraft paper fused at high temperature and pressure. Phenolic core colour to be the same as surface sheets with finished and polished edges.
 - .1 Minimum panel thickness:
 - .1 Doors and pilasters: 19 mm.
 - .2 Panels: 13 mm.
- .3 Pilaster support: adjustable bolts with stainless steel collar to ASTM A167.
- .4 Anchor Hardware: Wall and panel brackets, chrome plated non-ferrous die cast zinc alloy or clear anodized aluminum castings and extrusions. Overhead bracing with anti-grip design.
- .5 Pilaster shoe: aluminum, not less than 75 mm high.
- .6 Exposed fasteners: cadmium plated steel, tamper-proof type.
- .7 Concealed fasteners: steel, hot-dip galvanized.
- .8 Provide accessories as required for complete installation.

2.3 COMPONENTS

- .1 Hinges:
 - .1 Heavy duty, non-lubricating.
 - .2 Material/finish: stainless steel casting.
 - .3 Swing: as indicated on Drawings.
 - .4 Return movement: gravity.
 - .5 Adjustable to hold door open at any angle up to 90 degrees.
 - .6 Emergency access feature.
- .2 Latch set: built-in, combination latch, door-stop, keeper and bumper, stainless steel, with emergency access feature.
 - .1 Acceptable Material:
 - .1 Barrier-free lever latch, Hadrian
- .3 Coat hook: combination hook and rubber door bumper, chrome plated non-ferrous.
- .4 Door pull: Barrier-free type suited for outswinging doors, chrome plated non-ferrous.

2.4 FABRICATION

- .1 Fabricate standard access stall doors a minimum 610 mm wide inward swinging and barrier free access stall doors a minimum 800 mm clear wide outward swinging (with door in open position (825 mm total)) or as noted on drawings with stall widths to minimum dimensions indicated on Drawings and in accordance with CAN/CSA B651 and 2015 National Building Code.
- .2 Provide formed and closed edges for doors, panels and pilasters. Miter and weld corners and grind smooth.
- .3 Provide internal reinforcement at areas of attached hardware and fittings. Temporarily mark location of reinforcement for tissue holders, and grab bars.

2.5 FINISHES

- .1 Finish: Doors and pilaster/panels same colour. Confirm colour with Departmental Representative prior to ordering.

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 site conditions where Work will be applied and ensure acceptability for complete and satisfactory installation. Report unsatisfactory conditions to Departmental Representative.
- .2 Install partitions when unsatisfactory conditions have been corrected.

3.3 PREPARATION

- .1 Ensure supplementary anchorage, if required, is in place.
- .2 Do work in accordance with CSA-B651.

3.4 INSTALLATION

- .1 Install partitions secure, plumb and square.
- .2 Leave 12 mm space between wall and panel or end pilaster.
- .3 Attach panel and pilaster to brackets with through type sleeve bolt and nut.
- .4 Provide for adjustment of floor variations with screw jack through steel saddles made integral with pilaster. Conceal floor fixings with stainless steel shoes.
- .5 Provide templates for locating threaded studs through finished ceilings.
- .6 Equip each door with hinges, latch set, and coat hooks, and as follows:
 - .1 Mount coat hook on door as indicated in Section 10 28 10.
 - .2 Provide 1 coat hook at 1650 mm for standard stalls.
 - .3 Provide 1 additional coat hook (2 total) at 1250 mm from floor on barrier free door:

- .1 Adjust and align hardware for easy, proper function.
 - .2 Set door open position at 30° to front. Install door bumper; door mounting.
- .7 Equip outswinging doors with door pulls on inside and outside of door in accordance with CSA-B651.
- .8 Floor supported and overhead braced partition installation:
 - .1 Attach pilasters to floor with pilaster supports and level, plumb, and tighten installation with levelling device.
 - .2 Secure pilaster shoes in position.
 - .3 Secure headrail to pilaster face with not less than two fasteners per face.
 - .4 Set tops of doors parallel with overhead brace when doors are in closed position.

3.5 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.

3.6 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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 08 80 50 - Glazing: Mirrors.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A153/A153M-16a, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .2 ASTM A167-99 (2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .3 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A666-15, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - .5 ASTM A924/A924M-16ae1, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .6 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.
 - .7 ASTM B16/B16M-10 (2015), Standard Specifications for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines.
 - .8 ASTM B19-15, Standard Specification for Cartridge Brass Sheet, Strip, Plate, Bar, and Disks.
 - .9 ASTM B456-11e1, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - .10 ASTM C1503 -08(2013), Standard Specification for Silvered Flat Glass Mirror.
- .2 Canadian Standards Association (CSA)
 - .1 CSA-B651-12, Accessible Design for the Built Environment.
 - .2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet.
- .2 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures:
 - .1 Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

- .3 Submit samples in accordance with Section 01 33 00 – Submittals:
 - .1 Samples to be returned for inclusion into work.
- .4 Submit closeout data in accordance with Section 01 78 00 – Closeout Submittals:
 - .1 Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .2 Include list of sources for disposable supplies, replacement parts and service recommendations.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Waste Management and Disposal.

1.5 EXTRA MATERIALS

- .1 Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 - Closeout Submittals.
- .2 Deliver special tools to Departmental Representative.

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 ASI Specialties Inc.
 - .2 Bobrick Washroom Equipment of Canada Ltd.
 - .3 Bradley Corporation.
 - .4 Frost

2.2 MATERIALS

- .1 Sheet steel: to ASTM A653/A653M cold rolled, commercial quality, 0.912 mm minimum nominal thickness, with ZF001 designation zinc coating.
- .2 Stainless steel sheet metal: to ASTM A666, Type 304, finish as indicated in component list in 1.519 mm minimum nominal thickness.
- .3 Stainless steel tubing: Type 304, commercial grade, seamless welded, 1.2 mm wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized after fabrication, tamper and theft resistant exposed fasteners to match material of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.3 COMPONENTS

- .1 Components: as identified on Drawings.

2.4 FABRICATION

- .1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.
- .2 Wherever possible form exposed surfaces from one sheet of stock, free of joints.
- .3 Brake form sheet metal work with 1.5 mm radius bends.
- .4 Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- .5 Back paint components where contact is made with building finishes to prevent electrolysis.
- .6 Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.
- .7 Shop assemble components and package complete with anchors and fittings.
- .8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.
- .9 Provide steel anchor plates and components for installation on studding and building framing.

2.5 FINISHES

- .1 Chrome and nickel plating: to ASTM B456, satin finish.
- .2 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Departmental Representative.
- .3 Labels: Exposed faces, provide maximum 38 mm diameter stamped manufacturer logo.

Part 3 Execution

3.1 PREPARATION

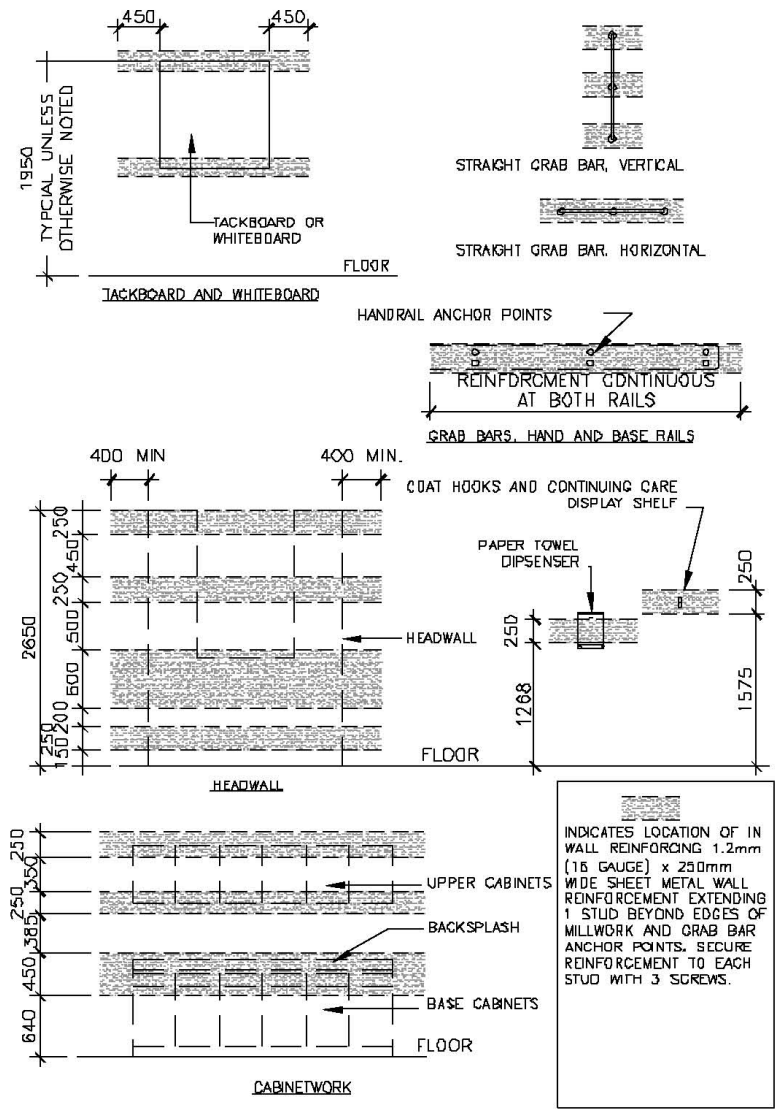
- .1 Verify wall thickness and construction that will accept recessed accessories.
- .2 Verify that solid blocking for support and anchoring of washroom accessories is installed where required. Confirm exact height and location with Departmental Representative and Manufacturers' Instructions.
- .3 Verify that frames and anchors provided, whether by this Section or others, are correctly and securely installed ready to accept the accessory scheduled for the specific location.
- .4 Verify that painting is complete and dry in area of installation before accessories are installed.

3.2 INSTALLATION

- .1 Install accessories at heights to meet barrier free compliance and in coordination with drawings. Confirm heights with Departmental Representative prior to installation.
- .2 Install and secure accessories rigidly in place as follows:
 - .1 Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.
 - .2 Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.
 - .3 Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.
 - .4 Toilet/shower compartments: use male/female through bolts.
- .3 Install grab bars on built-in anchors provided by bar manufacturer.
- .4 Use tamper proof screws/bolts for fasteners.
- .5 Fill units with necessary supplies shortly before final acceptance of building.
- .6 Install mirrors in accordance with Section 08 80 50 - Glazing.

3.3 SCHEDULE

- .1 Locate accessories where indicated on drawings. Exact locations determined by Departmental Representative.



Wall Reinforcement Details

END OF SECTION