

<b>SECTION NO.</b>	<b>SECTION TITLE</b>	<b>PAGES</b>
Division 01	General Requirements	
011100	Summary of Work	3
011400	Work Restrictions	2
013119	Progress Meetings	2
013217	Construction Progress Schedule - Critical Path Method (CPM)	7
013300	Submittal Procedures	4
013530	Health and Safety Requirements	4
013543	Environmental Procedures	3
014100	Regulatory Requirements	1
014500	Quality Control	2
014715	Sustainable Requirements: Construction	4
015200	Construction Facilities	3
015600	Temporary Barriers and Enclosures	2
016100	Common Product Requirements	4
017100	Examination And Preparation	1
017303	Execution Requirements	2
017411	Cleaning	2
017421	Construction/Demolition Waste Management And Disposal	3
017700	Closeout Procedures	2
017800	Closeout Submittals	6
017900	Demonstration and Training	2
019100	Commissioning	2
Division 06		
062000	Finish Carpentry	4
064000	Architectural Woodwork	4
Division 09	Architectural	
090362	Historical - Repainting Interior Surfaces	10
090351	Historical - Plaster	3
099123	Interior Painting	9

Division 23	Heating, Ventilating and Air Conditioning (HVAC)	
230500	Common Work Results – Mechanical	2
230517	Pipe Welding	2
238235	Commercial Convectors	2
Division 26	Electrical	
260500	Common Work Results – Electrical	3
260507	Fire Stopping and Smoke Seal Systems	1
260515	Seismic Control and Restraint	1
260532	Outlet Boxes	1
261520	Wires and Cables	1
261525	Bonding and Grounding	2
261530	Panelboard	1
262505	Electric Heating	1

END OF TABLE OF CONTENTS

**Part 1 General**

**1.1 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises of renovation of elements within the Journeys End Building, located at Fort Rodd Hill, Victoria, BC; and further identified as a Recognized Federal Heritage Building.

**1.2 CONTRACT METHOD**

- .1 Construct Work under single contract (Design-Bid-Build).

**1.3 WORK BY OTHERS**

- .1 Cooperate with other Contractors in carrying out their respective works.
- .2 Coordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to in writing, any defects which may interfere with proper execution of Work.

**1.4 WORK SEQUENCE**

- .1 Construct Work in stages to accommodate Departmental Representative continued use of premises during construction.
- .2 Co-ordinate Progress Schedule and coordinate with Building Occupancy during construction.
- .3 Maintain fire exit/access/control.

**1.5 CONTRACTOR USE OF PREMISES**

- .1 Limit use of premises for Work, for storage, and for access, to allow:
  - .1 Occupancy.
- .2 Coordinate 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 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work.
- .5 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

**1.6 BUILDING OCCUPANCY**

- .1 premise shall be occupied during entire construction period for execution of normal operations.

- .2 Cooperate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Owner usage.

#### **1.7 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

- .1 Execute work with least possible interference or disturbance to building operations, occupants, and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- .2 Protect wall, floors, and all elements of building during construction.
- .3 Protect all Heritage Defining Elements. Any damage shall be repaired to Departmental Representative's satisfaction at contractor's cost.

#### **1.8 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 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 Departmental Representative with minimum disturbance.
- .3 Provide alternative routes for personnel , and vehicular traffic when required.
- .4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .5 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .6 Provide temporary services to maintain critical building and tenant systems.
- .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.

#### **1.9 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 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents. Other documents as specified.
- .11 Permits

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1 General**

**1.1 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 Contractor will need to provide sanitary facilities for use by Contractor's personnel. Keep facilities clean.

**1.2 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

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

**1.3 SPECIAL REQUIREMENTS**

- .1 The building is a Recognized Federal Heritage Building and as such has elements that cannot be disturbed and for all work any disturbance will be kept to a minimum. Mock-ups and other non-destructive/non-invasive means of indicating work to be completed will be necessary before any work is executed to ensure heritage elements are not unduly disturbed.
- .2 Submit schedule in accordance with Section 01 32 17 - Construction Progress Schedule - Critical Path Method (CPM)
- .3 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 Ingress and egress of Contractor vehicles at site is limited to areas as specified by Departmental Representative.
- .6 Deliver materials outside of peak traffic hours 17:00 to 07:00 unless otherwise approved by Departmental Representative.

**1.4 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions. Smoking is not allowed.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                ADMINISTRATIVE**

- .1      Schedule and administer project meetings throughout the progress of the work, at 2-week intervals.
- .2      Prepare agenda for meetings.
- .3      Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4      Coordinate with Departmental Representative for physical space and make arrangements for meetings. Virtual meetings may be used except bi-weekly meetings on site.
- .5      Preside at meetings.
- .6      Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2                PRE-CONSTRUCTION MEETING**

- .1      Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities. Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .2      Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .3      Agenda to include:
  - .1      Appointment of official representative of participants in the Work.
  - .2      Schedule of Work: in accordance with Section 01 32 17 - Construction Progress Schedule - Critical Path Method (CPM)
  - .3      Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4      Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5      Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .6      Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .7      Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
  - .8      Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
  - .9      Appointment of inspection and testing agencies or firms.
  - .10     Insurances, transcript of policies.



**1.3                    PROGRESS MEETINGS**

- .1        During course of Work and 1 weeks prior to project completion, schedule progress meetings bi-weekly (2-week intervals)
- .2        Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .3        Notify parties minimum 4 days prior to meetings.
- .4        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**

- .1        Not Used.

**Part 3                Execution**

**3.1                    NOT USED**

- .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      Actual Finish Date (AF): point in time that Work actually ended on activity
- .3      Actual Start Date (AS): point in time that Work actually started on activity.
- .4      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.
- .5      Baseline: original approved plan (for Project, work package, or activity), plus or minus approved scope changes.
- .6      Completion Milestones: they are firstly Substantial Completion and secondly Final Certificate.
- .7      Constraint: applicable restriction that will affect performance of Project. Factors that affect activities can be scheduled.
- .8      Control: process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate corrective action as needed.
- .9      Critical Activity: any activity on a critical path. Most commonly determined by using critical path method.
- .10     Critical Path: series of activities that determines duration of Project. In deterministic model, critical path is usually defined as those activities with float less than or equal to specified value, often zero. It is longest path through Project.
- .11     Critical Path Method (CPM): network analysis technique used to predict Project duration by analyzing which sequence of activities (which path) has least amount of scheduling flexibility (least amount of float).
- .12     Data Date (DD): date at which, or up to which, Project's reporting system has provided actual status and accomplishments.
- .13     Duration (DU): number of work periods (not including holidays or other non-working periods) required to complete activity or other Project element. Usually expressed as workdays or work weeks.
- .14     Early Finish Date (EF): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can finish, based on network logic and schedule constraints. Early finish dates can change as Project progresses and changes are made to Project plan.

- .15 Early Start Date (ES): in critical path method, earliest possible point in time on which uncompleted portions of activity (or Project) can start, based on network logic and schedule constraints. Early start dates can change as Project progresses and changes are made to Project Plan.
- .16 Finish Date: point in time associated with activity's completion. Usually qualified by one of following: actual, planned, estimated, scheduled, early, late, baseline, target, or current.
- .17 Float: amount of time that activity may be delayed from its early start without delaying Project finish date. Float is mathematical calculation and can change as Project progresses and changes are made to Project plan.
- .18 Lag: modification of logical relationship that directs delay in successor task.
- .19 Late Finish Date (LF): in critical path method, latest possible point in time that activity may be completed without delaying specified milestone (usually Project finish date).
- .20 Late Start Date (LS): in critical path method, latest possible point in time that activity may begin without delaying specified milestone (usually Project finish date).
- .21 Lead: modification of logical relationship that allows acceleration of successor task.
- .22 Logic Diagram: see Project network diagram.
- .23 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .24 Milestone: significant event in Project, usually completion of major deliverable.
- .25 Monitoring: capture, analysis, and reporting of Project performance, usually as compared to plan.
- .26 Near-Critical Activity: activity that has low total float.
- .27 Non-Critical Activities: activities which when delayed, do not affect specified Contract duration.
- .28 Project Control System: fully computerized system utilizing commercially available software packages.
- .29 Project Network Diagram: schematic display of logical relationships of Project activities. Always drawn from left to right to reflect Project chronology.
- .30 Project Plan: formal, approved document used to guide both Project execution and Project control. Primary uses of Project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost, and schedule baselines. Project plan may be summary or detailed.
- .31 Project Planning: development and maintenance of Project Plan.

- .32 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of Project Work in relation to established milestones.
- .33 Project Schedule: planned dates for performing activities and 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.
- .34 Quantified days duration: working days based on 5-day work week, discounting statutory holidays.
- .35 Risk: uncertain event or condition that, if it occurs, has positive or negative effect on Project's objectives.
- .36 Scheduled Finish Date (SF): point in time that Work was scheduled to finish on activity. Scheduled finish date is normally within range of dates delimited by early finish date and late finish date.
- .37 Scheduled Start Date (SS): point in time that Work was scheduled to start on activity. Scheduled start date is normally within range of dates delimited by early start date and late start date.
- .38 Start Date: point in time associated with activity's start, usually qualified by one of following: actual, planned, estimated, scheduled, early, late, target, baseline, or current.
- .39 Work Breakdown Structure (WBS): deliverable-oriented grouping of project elements that organizes and defines total Work scope of Project. Each descending level represents increasingly detailed definition of Project Work.

## 1.2 SYSTEM DESCRIPTION

- .1 Construction Progress Schedule (Project Time Management): describes processes required to ensure timely completion of Project. These processes ensure that various elements of Project are properly co-ordinated. It consists of planning, time estimating, scheduling, progress monitoring and control.
- .2 Planning: this is most basic function of management, that of determining presentation of action and is essential.
  - .1 It involves focusing on objective consideration of future, and integrating forward thinking with analysis; therefore, in planning, implicit assumptions are made about future so that action can be taken today.
  - .2 Planning and scheduling facilitates accomplishment of objectives and should be considered continuous interactive process involving planning, review, scheduling, analysis, monitoring and reporting.
- .3 Ensure that planning process is iterative and results in generally top-down processing with more detail being developed as planning progresses, and decisions concerning options and alternatives are made. This implies progressively more reliability of scheduling data. Detail Project schedule is used for analysis and progress monitoring.

- .4 Ensure project schedule efficiencies through monitoring.
  - .1 When activities begin on time and are performed according to estimated durations without interruptions, original Critical Path will remain accurate. Changes and delays will, however, create an essential need for continual monitoring of Project activities.
  - .2 Monitor progress of Project in detail to ensure integrity of Critical Path, by comparing actual completions of individual activities with their scheduled completions, and review progress of activities that has started but are not yet completed.
  - .3 Monitoring should be done sufficiently often so that causes of delays are immediately identified and removed if possible.
- .5 Project monitoring and reporting: as Project progresses, keep team aware of changes to schedule, and possible consequences. In addition to Bar Charts and CPM networks, use narrative reports to provide advice on seriousness of difficulties and measures to overcome them.
  - .1 Narrative reporting begins with statement on general status of Project followed by summarization of delays, potential problems, corrective measures and Project status criticality.
- .6 Ensure Master Plan and Detail Schedule are practical and remain within specified Contract duration.
- .7 Master Plan and Detail Schedule deemed impractical by Departmental Representative are revised and resubmitted for approval.
- .8 Acceptance of Master Plan and Detail Schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract. Duration of Contract may only be changed through bilateral Agreement.
- .9 Calculate dates for completion milestones from Plan and Schedule using specified time periods for Contract.
- .10 Delays to non-critical activities, may not be basis for time extension.
- .11 Allow for and show Master Plan and Detail Schedule adverse weather conditions normally anticipated. Specified Contract duration has been predicated assuming normal amount of adverse weather conditions.
- .12 Provide necessary crews and manpower to meet schedule requirements for performing Work within specified Contract duration. Simultaneous use of multiple crews on multiple fronts on multiple critical paths may be required.

### **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative Project Control System for planning, scheduling, monitoring and reporting of project progress. Submit letter ensuring that schedule has been prepared in co-ordination with major sub-contractors.

#### **1.4 QUALITY ASSURANCE**

- .1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

#### **1.5 PROJECT MEETING**

- .1 Meet with Departmental Representative within 15 working days of Award of Contract date, to establish Work requirements and approach to project construction operations.

#### **1.6 PROJECT MILESTONES**

- .1 Mandatory and recommended project milestones form targets for both Master Plan and Detail Schedule of CPM construction network system. Coordinate milestones with Departmental Representative.

#### **1.7 DETAIL SCHEDULE**

- .1 Provide detailed project schedule (CPM logic diagram) within 15 working days of Award of Contract date showing activity sequencing, interdependencies, and duration estimates. Include listed activities as follows:
  - .1 Shop drawings.
  - .2 Samples.
  - .3 Approvals.
  - .4 Procurement.
  - .5 Construction.
  - .6 Installation.
  - .7 Testing.
  - .8 Commissioning and acceptance.
- .2 Clearly show sequence and interdependence of construction activities and indicate:
  - .1 Start and completion of all items of Work, their major components, and interim milestone completion dates.
  - .2 Activities for procurement, delivery, installation and completion of each major piece of equipment, materials and other supplies, including:
    - .1 Time for submittals, re-submittals and review.
    - .2 Time for fabrication and delivery of manufactured products for Work.
    - .3 Interdependence of procurement and construction activities.
  - .3 Include sufficient detail to assure adequate planning and execution of Work.
- .3 Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow co-ordination and control of project activities. Show continuous flow from left to right.
- .4 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Departmental Representative for review effects created by insertion of new Change Order.

## **1.8 REVIEW OF THE CONSTRUCTION DETAIL SCHEDULE**

- .1 Allow 5 workdays for review by Departmental Representative of proposed construction Detail Schedule.
- .2 Upon receipt of reviewed Detail Schedule make necessary revisions and resubmit to Departmental Representative for review within 5 workdays.
- .3 Promptly provide additional information to validate practicability of Detail Schedule as required by Departmental Representative.
- .4 Submittal of Detail Schedule indicates that it meets Contract requirements and will be executed generally in sequence.

## **1.9 COMPLIANCE WITH DETAIL SCHEDULE**

- .1 Comply with reviewed Detail Schedule.
- .2 Proceed with significant changes and deviations from scheduled sequence of activities that cause delay, only after written receipt of approval by Departmental Representative.
- .3 Identify activities that are behind schedule and causing delay. Provide measures at no cost to regain slippage.
  - .1 Corrective measures may include:
    - .1 Increase of personnel on site for effected activities or work package.
    - .2 Overtime work/additional work shifts.

## **1.10 PROGRESS MONITORING AND REPORTING**

- .1 On ongoing basis, Detail Schedule on job site must show "Progress to Date". Arrange participation on and off site of subcontractors and suppliers to establish progress on each current activity shown on applicable networks.
- .2 Update and reissue as project develops and changes.
- .3 Submit to Departmental Representative copies of updated Detail Schedule.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not used.

## **Part 3 Execution**

### **3.1 NOT USED**

- .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. 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.
- .5       Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6       Verify field measurements and affected adjacent Work are co-ordinated.
- .7       Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .8       Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .9       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       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.
- .3       Allow 7 days for Departmental Representative's review of each submission.
- .4       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.

- .5 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.
- .6 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.
- .7 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier/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.
- .8 After Departmental Representative's review, distribute copies.
- .9 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.
- .10 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.
- .11 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.
- .12 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.
- .13 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .14 Delete information not applicable to project.
- .15 Supplement standard information to provide details applicable to project.

### **1.3 SAMPLES**

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .3 Where colour, pattern or texture is criterion, submit full range of samples.
- .4 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.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .6 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.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Health and safety considerations required to ensure due diligence towards health and safety on construction sites.

**1.2 REFERENCES**

- .1 Canada Labour Code, Canada Occupational Safety and Health Regulations.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .3 Province of British Columbia
  - .1 Workers Compensation Act

**1.3 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
- .3 Submit 1copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures
- .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 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

#### **1.4 FILING OF NOTICE**

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

#### **1.5 SAFETY ASSESSMENT**

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

#### **1.6 MEETINGS**

- .1 Schedule and administer Health and Safety meeting prior to commencement of Work.

#### **1.7 PROJECT/SITE CONDITIONS**

- .1 Work at site will involve contact with:
  - .1 Typical construction materials (concrete, paint, wood, etc.)
  - .2 Hazardous Materials as identified in Hazardous Materials report (March 2016) provided.

#### **1.8 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.

#### **1.9 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.

#### **1.10 COMPLIANCE REQUIREMENTS**

- .1 Comply with Workers Compensation Act B.C.
- .2 Comply with Occupational Health and Safety Regulations.
- .3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

#### **1.11 UNFORESEEN 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 BC having jurisdiction and advise Departmental Representative verbally and in writing.

**1.12 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with the work.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work./.

**1.13 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 BC having jurisdiction, and in consultation with Departmental Representative.

**1.14 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.

**1.15 BLASTING**

- .1 Blasting or other use of explosives is not permitted.

**1.16 POWDER ACTUATED DEVICES**

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

**1.17 WORK STOPPAGE**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not used.

**END OF SECTION**



## **Part 1 General**

### **1.1 DEFINITIONS**

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

### **1.2 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction a minimum of 7 days prior to mobilization.
- .3 Address topics at level of detail commensurate with environmental issue and required construction task[s].
- .4 Environmental protection plan: include:
  - .1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
  - .2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.
  - .3 Name[s] and qualifications of person[s] responsible for training site personnel.
  - .4 Descriptions of environmental protection personnel training program.
  - .5 Drawings showing locations of proposed material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
  - .6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
  - .7 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
  - .8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
  - .9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

- .10 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .11 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

### **1.3 DISPOSAL OF WASTES**

- .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Dispose of hazardous materials at proper designated disposal area and provide receipt to Departmental Representative.
- .4 Dispose of fuel oil in existing tank at proper designated disposal area and provide receipt to Departmental Representative.
- .5 Dispose of fuel oil tank at proper designated disposal area and provide receipt to Departmental Representative.

### **1.4 DRAINAGE**

- .1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .3 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .4 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.
- .2 Protect roots of designated trees to drip-line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Minimize stripping of topsoil and vegetation.

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

**1.7 HISTORICAL / ARCHAEOLOGICAL CONTROL**

- .1 Department Representative will provide archaeologist monitoring of all ground disturbances. Contractor to provide Department Representative written notice of ground disturbance work a minimum of 14 days before work is scheduled to commence.
- .2 Assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

**1.8 NOTIFICATION**

- .1 Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan. Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .2 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .3 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES AND CODES**

- .1 Perform Work in accordance with National Building Code of Canada (NBC) 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.

**1.2 HAZARDOUS MATERIAL DISCOVERY**

- .1 The building has been assessed for Hazardous Materials as per report in Appendix A. Contractor to advise if additional hazardous (or suspected) material is discovered. Contractor is responsible for all abatement to complete scope of work.
- .2 Asbestos: Stop work immediately when material that may contain asbestos is encountered during demolition work. Notify Departmental Representative.
- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative.

**1.3 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions and municipal by-laws. No smoking on site.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1.1 INSPECTION**

- .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.

## **1.2 INDEPENDENT INSPECTION AGENCIES**

- .1 Provide equipment required for executing inspection and testing by appointed agencies.
- .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

## **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 and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in 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 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 MOCK-UPS**

- .1 Prepare mock-ups for Work specifically requested in specifications and drawings. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative 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.

## **1.7 EQUIPMENT AND SYSTEMS**

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

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 PRECEDENCE**

- .1 For Federal Government Projects, Division 1 Sections take precedence over technical specifications in other Divisions of this Project Manual.

**1.2 SECTION INCLUDES**

- .1 This Section includes specific environmental and sustainable development requirements for building materials, products and systems needed to ensure that this project complies with green design processes and clients' sustainable development plan.

**1.3 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section [01 35 73 - Procedures for Deconstruction of Structures].
- .3 Section 01 47 15 - Sustainable Requirements: Construction.

**1.4 SUBMITTALS**

- .1 Provide submittals for work in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Material Safety Data Sheets (MSDS)
  - .1 Submit Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures for the following products. Indicate VOC emissions, prior to installation or use:
    - .1 Adhesives.
    - .2 Caulking compounds.
    - .3 Sealants.
    - .4 Fireproofing or fire stopping materials.
    - .5 Paints.
    - .6 Floor and wall patching or levelling materials.
    - .7 Clear finishes for wood surfaces.
  - .2 MSDS sheets to comply with Occupational Health and Safety requirements.
- .3 Construction Schedule
  - .1 Submit schedule of construction in accordance with Section 01 33 00 - Submittal Procedures, prior to start of work, in coordination with scheduling requirements, including:
    - .1 Sequence of finish applications and allowances for curing times.
    - .2 Identification of finish types.
    - .3 Schedule and duration of proposed temporary ventilation.
    - .4 Delivery schedules of manufactured materials which are anticipated to off-gas in timely manner, which will allow for airing of those materials prior to their scheduled installation.

- .5 Indicate and schedule commissioning procedures and temporary usages of building mechanical systems, identifying types of filtration and schedule for filter replacement.

- .4 EcoLogo Labelled Products

- .1 Submit of list of EcoLogo products and services proposed for this project in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit list of proposed non-endorsed products and services to for review.

## 1.5 HAZARDOUS MATERIALS

- .1 Contractor is to submit health and safety plan identifying methods and procedures for all hazardous materials as required.
- .2 Take measures to ensure chemical spills do not enter drains.
- .3 Provide proper storage and containment of herbicides and indoor pesticides.
  - .1 Design and construction of storage spaces for hazardous materials in accordance with building and fire codes.
  - .2 Provide ventilation of areas, which contain potential sources of air contamination. Comply with standards for storage of flammable, combustible and hazardous materials, explosives, compressed gas cylinders, and reactive, corrosive and oxidizing materials.

## 1.6 EROSION AND SEDIMENTATION CONTROL

- .1 Follow methods and procedures specified in Sections for Excavating, Trenching and Backfilling.
- .2 Establish long-term soil stabilization program as indicated.
- .3 Take measures to prevent loss of soil by storm water runoff.
- .4 Protect stockpiled topsoil.

## 1.7 REDUCING SITE DISTURBANCES

- .1 When building is to be on previously undeveloped site comply with following requirements:
  - .1 Avoid major alterations to sensitive topography, vegetation and wildlife habitat in areas indicated.
  - .2 Create traffic patterns, that cause minimum site disruptions.
- .2 Minimize disturbances to watershed using site water management measures to ensure that watersheds and groundwater will be preserved.
- .3 Construct and erect erosion barriers as required.
- .4 Take measures to avoid soil compaction.
- .5 Contractor to return site to condition, or better condition, before work commenced.



## **1.8 BUILDING ENVELOPE**

- .1 Maintain integrity of building envelope using air barriers and vapour retarders and avoid thermal bridging to provide thermal comfort and prevent condensation.

## **1.9 GENERAL CONSTRUCTION MATERIALS/PRACTICES**

- .1 Materials and Resources
  - .1 Incorporate reused building materials as indicated.
- .2 Storage and Collection of Recyclables
  - .1 Provide separate storage/handling facilities for consumer recyclables including used paper, newspaper, newsprint, cardboard, glass, metal and plastic.
- .3 Construction Waste Management
  - .1 Follow recommendations and requirements of this projects construction, renovation and demolition (CRD) waste management plan].
  - .2 Resource Reuse
    - .1 Use materials that have been remanufactured for this project's building systems and materials where possible.
  - .3 Recycled Content
    - .1 Use systems and materials with post-consumer and post-industrial recycled content where possible.
  - .4 Wood
    - .1 Use lumber sourced from independently certified well-managed forests in accordance with CSA or Forestry Stewardship Council.
    - .2 Materials made from composite wood materials or agricultural products: not contain urea-formaldehyde resins.
  - .5 Durability
    - .1 Use durable building systems and materials:
      - .1 Requiring low maintenance (painting, re-treatment, and waterproofing).
      - .2 Having minimal environmental impact.

## **1.10 PAINTS, STAINS, AND VARNISHES**

- .1 Use paints and coatings that meet or exceed VOC limits established by Environmental Choice Programs guideline for water borne surface coatings.

## **1.11 SEALANTS, ADHESIVES AND COMPOUNDS**

- .1 Use adhesives that meet or exceed VOC limits established by Environmental Choice Programs guideline for adhesives.
- .2 Use sealant products that meet or exceed VOC limits established by Environmental Choice Programs guideline for sealants.

**Part 2            Products**

**2.1                NOT USED**

.1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

**1.1 SUBMITTALS**

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

**1.2 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 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.

**1.3 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.

**1.4 CONSTRUCTION PARKING**

- .1 Parking will be permitted on site provided it does not disrupt performance of Work or Operations by Parks Canada.

**1.5 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.

**1.6 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

**1.7 CONSTRUCTION SIGNAGE**

- .1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Departmental Representative.
- .2 No other signs or advertisements, other than warning signs, are permitted on site.

- .3 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .4 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.

## **1.8 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .2 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
- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .7 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .8 Provide snow removal during period of Work.

## **1.9 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**

- .1 Not Used.

## **Part 3 Execution**

- Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                INSTALLATION AND REMOVAL**

- .1        Provide temporary controls in order to execute Work expeditiously.
- .2        Remove from site all such work after use.

**1.2                HOARDING**

- .1        Provide barriers around work areas to mitigate dust. Clean areas of work continuously and thoroughly after work is complete.

**1.3                DUST TIGHT SCREENS**

- .1        Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2        Maintain and relocate protection until such work is complete.

**1.4                ACCESS TO SITE**

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

**1.5                FIRE ROUTES**

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

**1.6                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.

**1.7                WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2            Products**

**2.1                NOT USED**

.1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1            Not Used.

**END OF SECTION**

## **Part 1 General**

### **1.1 REFERENCES**

- .1 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 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.
- .3 Cost for such testing will be born by Departmental Representative 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. Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 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 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .6 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.
- .7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .8 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over nameplates.

#### **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, so that Departmental Representative will establish course of action.
- .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.
- .4 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.
- .5 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .6 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

## **1.7 COORDINATION**

- .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.

## **1.8 CONCEALMENT**

- .1 In finished areas conceal pipes 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.

## **1.9 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.

## **1.10 LOCATION OF FIXTURES**

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

## **1.11 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 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.

## **1.12 FASTENINGS - EQUIPMENT**

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

**1.13 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.

**1.14 EXISTING UTILITIES**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .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 line, cap or otherwise seal lines at cut-off points as directed by Contract Documents

**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 work as it progresses.
- .2        Record locations of maintained, re-routed and abandoned service lines.

**Part 2            Products**

**2.1                NOT USED**

- .1        Not Used.

**Part 3            Execution**

**3.1                NOT USED**

- .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 Heritage elements of building including plaster (walls and ceilings) wooden elements, floors.
  - .2 Efficiency, maintenance, or safety of operational elements.
  - .3 Visual qualities of sight-exposed elements.
- .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 Date and time work will be executed.

**1.2 MATERIALS**

- .1 Required for original installation.

**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.

**1.4 EXECUTION**

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Remove and replace defective and non-conforming Work.
- .4 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

- .6 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .7 Restore work with new products in accordance with requirements of Contract Documents.
- .8 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .9 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance UL approved firestop assemblies for the specific fire rated assembly being penetrated and the material penetrating.
- .10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .11 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 - Construction/Demolition Waste Management And Disposal.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 NOT USED**

- .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.
- .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.
- .3        Clear snow and ice from access to building. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4        Provide on-site containers for collection of waste materials and debris.
- .5        Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .6        Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.
- .7        Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .8        Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .9        Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .10       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        When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2        Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .3        Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4        Remove waste products and debris other than that caused by Owner or other Contractors.
- .5        Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

- .7 Clean hardware, painted wood elements, wall tile, stainless steel, chrome and mechanical and electrical fixtures.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces if dusty from work.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens where affected by work.
- .11 Prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .14 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 - Construction/Demolition Waste Management And Disposal.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**



**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects.

**1.2 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.

**1.3 PRECEDENCE**

- .1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**1.4 DEFINITIONS**

- .1 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.
- .2 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .3 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.
- .4 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2 Returning reusable items including pallets or unused products to vendors.
- .5 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .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.

**1.5 STORAGE, HANDLING AND PROTECTION**

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.

- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 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.

## **1.6 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

## **1.7 USE OF SITE AND FACILITIES**

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

## **1.8 SCHEDULING**

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

## **Part 2 Products**

### **2.1 NOT USED**

- .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.

**END OF SECTION**

**Part 1 General**

**1.1 INSPECTION AND DECLARATION**

- .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
- .2 Request Departmental Representative Inspection.
- .2 Departmental Representative Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 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 are fully operational.
  - .4 Operation of systems have been demonstrated to Owner's personnel.
  - .5 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: when Departmental Representative consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.
- .6 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.

**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 - Construction/Demolition Waste Management and Disposal.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.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 with Departmental Representative's comments.
- .4        Revise content of documents as required prior to final submittal.
- .5        Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English and French. Provide two hard copies and one electronic (PDF format) on USB stick.
- .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.

**1.2                FORMAT**

- .1        Organize data as instructional manual.
- .2        Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3        When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4        Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5        Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6        Provide tabbed flyleaf 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; date of submission; names.
  - .1 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .2 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

### **1.4 AS-BUILTS AND SAMPLES**

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

### **1.5 RECORDING ACTUAL SITE CONDITIONS**

- .1 Record information on set of black line opaque drawings.

- .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 locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .2 Field changes of dimension and detail.
  - .3 Changes made by change orders.
  - .4 Details not on original Contract Drawings.
  - .5 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 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.



- .9 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning (Cx) Requirements.
- .10 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.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Additional Requirements: as specified in individual specifications sections.

#### **1.8 MAINTENANCE MATERIALS**

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

#### **1.9 STORAGE, HANDLING AND PROTECTION**

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

#### **1.10 WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .3 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

- .4 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.
- .5 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .6 Conduct joint 10-month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .7 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
  - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items.
  - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
    - .1 Name of item.
    - .2 Model and serial numbers.
    - .3 Location where installed.
    - .4 Name and phone numbers of manufacturers or suppliers.
    - .5 Names, addresses and telephone numbers of sources of spare parts.
    - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
    - .7 Cross-reference to warranty certificates as applicable.
    - .8 Starting point and duration of warranty period.
    - .9 Summary of maintenance procedures required to continue warranty in force.
    - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
    - .11 Organization, names, and phone numbers of persons to call for warranty service.
    - .12 Typical response time and repair time expected for various warranted equipment.
  - .4 Contractor's plans for attendance at 12-month post-construction warranty inspections.

- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .8 Respond in a timely manner to oral or written notification of required construction warranty repair work.
- .9 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 DESCRIPTION**

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

**1.2 QUALITY CONTROL**

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

**1.3 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Departmental Representative's approval. Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

**1.4 CONDITIONS FOR DEMONSTRATIONS**

- .1 Equipment has been inspected and put into operation.
- .2 Testing, adjusting, and balancing has been performed in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements and equipment and systems are fully operational.
- .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

**1.5 PREPARATION**

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

**1.6 DEMONSTRATION AND INSTRUCTIONS**

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

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

#### **1.7 TIME ALLOCATED FOR INSTRUCTIONS**

- .1 Ensure amount of time required for instruction of each item of equipment or system as follows:
  - .1 Electric Baseboard Heaters (convectors) - 2 hours of instruction.
  - .2

#### **Part 2 Products**

##### **2.1 NOT USED**

- .1 Not Used.

#### **Part 3 Execution**

##### **3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1 Includes general requirements for commissioning facilities and facility systems.

**1.2                PRECEDENCE**

- .1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**1.3                QUALITY ASSURANCE**

- .1 Co-operate with testing organization services under provisions specified in Section 01 45 00 - Quality Control.
- .2 Comply with applicable procedures and standards of the certification sponsoring association.
- .3 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

**1.4                REFERENCES**

- .1 Associated Air Balance Council (AABC): National Standards For Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems.

**1.5                SUBMITTALS**

- .1 Prior to start of Work, submit name of organization proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.
- .2 Submit documentation to confirm organization compliance with quality assurance provision.
- .3 Submit reports of testing, adjusting, and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.

**1.6                PROCEDURES - GENERAL**

- .1 Comply with procedural standards of certifying association under whose standard services will be performed.
- .2 Notify Departmental Representative 3 days prior to beginning of operations.
- .3 Accurately record data for each step.
- .4 Report to Departmental Representative any deficiencies or defects noted during performance of services.

**1.7 FINAL REPORTS**

- .1 Organization having managerial responsibility shall make reports.
- .2 Ensure each form bears signature of recorder, and that of supervisor of reporting organization.
- .3 Identify each instrument used, and latest date of calibration of each.

**1.8 CONTRACTOR RESPONSIBILITIES**

- .1 Prepare each system for testing and balancing.
- .2 Cooperate with testing organization and provide access to equipment and systems.
- .3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.
- .4 Notify testing organization 7 days prior to time project will be ready for testing, adjusting, and balancing.

**1.9 PREPARATION**

- .1 Provide instruments required for testing, adjusting, and balancing operations.
- .2 Retain possession of instruments and remove at completion of services.
- .3 Verify systems installation is complete and in continuous operation.

**1.10 EXECUTION**

- .1 Test equipment, and adjust devices for proper operation.
- .2 Test thermostat operation of both on and off function of baseboard heaters and that temperature in space near baseboard heater is within range.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1 GENERAL**

### **1.01 REFERENCE STANDARDS**

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards, 1st edition, [2009].
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-[M87], Hardboard.
- .3 CSA International
  - .1 CSA B111-, Wire Nails, Spikes and Staples.
  - .2 CAN/CSA-Z809], Sustainable Forest Management.
- .7 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-, FSC Principle and Criteria for Forest Stewardship.
- .8 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber [2010].

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for Pinewood and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Indicate details of construction, profiles, jointing, fastening and other related details.
  - .2 Indicate materials, thicknesses, finishes and hardware.
- .4 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate [300 x 300 mm] samples of PINEWOOD.
- .5 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.
- .7 Sustainable Design Submittals:
  - .1 Low-Emitting Materials:
    - .1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.

### **1.03 QUALITY ASSURANCE**

- .1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).



## **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood products from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **2 PRODUCTS**

### **2.01 MATERIALS**

- .1 Softwood lumber: S4S, moisture content 19% or less in accordance with following standards:
  - .1 CSA O141.
  - .2 CAN/CSA-Z809 or FSC or SFI certified.
  - .3 NLGA Standard Grading Rules for Canadian Lumber.
  - .4 AWMAC premium grade, moisture content as specified.

### **2.02 ACCESSORIES**

- .1 Nails and staples: to CSA B111; galvanized to ASTM A 123/A 123M for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: brass type and size to suit application.
- .3 Splines: wood.

## **3 EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### 3.02 INSTALLATION

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

### 3.03 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 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
  - .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
  - .3 Make joints in baseboard, where necessary using a [45] degrees scarf type joint.
  - .4 Install door and window trim in single lengths without splicing.

### 3.04 INSTALLATION OF TRIM

- .1 Standing and running trim:
  - .1 Interior:
    - .1 Grade: A or premium.
    - .2 Solid stock: Pine species.

### 3.05 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.6 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by finish carpentry installation.

**END OF SECTION**

## **1 GENERAL**

### **1.02 REFERENCE STANDARDS**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI A208.1, Particleboard.
  - .2 ANSI A208.2, Medium Density Fiberboard (MDF) for Interior Applications.
  - .3 ANSI/HPVA HP-1, Standard for Hardwood and Decorative Plywood.
- .2 ASTM International
  - .1 ASTM E 1333, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  - .2 ASTM D 2832, Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .3 ASTM D 5116, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
  - .1 Architectural Woodwork Standards (AWS).
    - .1 AWS Manual - (2014)
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .5 CSA International
  - .1 CSA B111-74(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O141-05 (R2009), Softwood Lumber.
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .7 Green Seal Environmental Standards (GS)
  - .1 GS-11-11, Paints and Coatings.
  - .2 GS-36-11, Commercial Adhesives.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .9 International Organization for Standardization (ISO)
  - .1 ISO 14040-2006, Environmental Management-Life Cycle Assessment - Principles and Framework.
  - .2 ISO 14041-98, Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for architectural woodwork and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 43 -

- .3 Shop Drawings:
  - .1 Submit shop drawings in accordance with AWS requirements.
  - .2 Submit two copies.
    - .1 One will be returned with reviewed notations.
    - .2 Make corrections noted and distribute required copies prior to start of work
  - .3 Indicate on casework and counter top elevations location of backing required for attachment within walls.
- .4 Samples:
  - .1 Submit three sample sets of finished samples of each species and cut of wood to be used.
    - .1 Each sample set of three to represent range of color and grain expected.
  - .2 Submit three additional samples of each material for use of paint trade.
- .5 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

#### **1.04 QUALITY ASSURANCE**

- .1 Work in accordance with Grade or Grades specified of the AWS.
- .2 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .3 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with Work.
    - .3 When accepted, mock-up will demonstrate minimum standard for Work.
    - .4 Do not proceed with work prior to receipt of written acceptance of mock-up by Departmental Representative.
    - .5 Mock-up may remain as part of finished work.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors and in accordance with temperature and humidity range recommendations by the AWS in clean, dry, well-ventilated area.
  - .2 Store and protect architectural woodwork from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .3 Develop Construction Waste Management Plan related to Work of this Section.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of packaging material as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **2 PRODUCTS**

### **2.01 MATERIALS**

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content in accordance with following standards:
  - .1 CAN/CSA-Z809 or FSC or SFI certified.
  - .2 AWMAC premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable for all purposes.
- .3 Nails and staples: to CSA B111.
- .4 Wood screws: brass, type and size to suit application.
- .5 Splines: wood.

### **2.02 FABRICATION**

- .1 Set nails and countersink screws apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .3 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .4 Form shaped profiles and bends as indicated.

### **2.03 FINISHING**

- .1 Finish in accordance with Section 09 91 23 - Interior Painting.

## **3 EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with manufacturer's instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

### **3.02 INSTALLATION**

- .1 Install work in conformance with the AWS.
- .2 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Clean all surfaces].
  - .2 Remove excess glue from surfaces.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**3.04 PROTECTION**

- .1 Protect all work from damage until final inspection.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by architectural woodwork installation.

**END OF SECTION**

## **1 GENERAL**

### **1.01 REFERENCE STANDARDS**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 5-03, Standard Specification for Quicklime for Structural Purposes.
  - .2 ASTM C 35-012005, Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster.
  - .3 ASTM C 206-03, Standard Specification for Finishing Hydrated Lime.
  - .4 ASTM C 841-03, Standard Specification for Installation of Interior Lathing and Furring.
  - .5 ASTM C 842-05, Standard Specification for Application of Interior Gypsum Plaster.
  - .6 ASTM C 1489-01, Standard Specification for Lime Putty for Structural Purposes.
- .2 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

### **1.02 QUALITY ASSURANCE**

- .1 Qualifications: Work to be undertaken by skilled and qualified personnel.
- .2 Mock-up: construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .3 Locate where directed by Departmental Representative.
- .4 Before application of each plaster coat] at location designated by Departmental Representative prepare representative sample plastering coat.
- .5 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with plaster work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

### **1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .1 Ensure bagged materials are delivered to site and stored in original containers.
  - .2 Ensure loose material is delivered, clean, and stored to prevent contamination by foreign material.
  - .3 Protect material from damage by moisture and freezing.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **1.04 AMBIENT CONDITIONS**

- .1 Do plaster work when ambient temperature is between 13 degrees C and 21 degrees C under conditions specified in ASTM C 842.



- .2 Ventilate and heat to facilitate proper application and curing of plaster.
  - .1 Ensure that high temperatures do not affect plaster drying process when spotlights are used during repair of existing plaster.
- .3 Maintain air moisture content at 15% relative humidity to facilitate proper curing of plaster and minimize cracking.

## **2 PRODUCTS**

### **2.01 MATERIALS**

- .1 Gypsum Plaster: to ASTM C 842
- .2 Gypsum Gauging Plaster, Gauging plaster, Plaster of Paris, Gypsum Keene's Cement (anhydrous calcined gypsum)] to ASTM C 842.
- .3 Water: potable, free of substances that would affect set of plaster.

### **2.02 MIXES**

- .1 Traditional plaster mix: proportion mix by volume as specified by manufacturer.
- .2 Mix plaster in accordance with ASTM C 842 unless otherwise specified or premixed plaster manufacturer's written recommendations.
- .3 Have materials hand mixed.
- .4 Keep mixing tools and bins free of hardened residue.

## **3 EXECUTION**

### **3.01 SITE VERIFICATION OF CONDITIONS**

- .1 Examine and report in writing to Departmental Representative areas of deteriorated plaster not previously identified.
- .2 Obtain Departmental Representative's approval and instructions for repair and replacement of plaster before proceeding with repair work.

### **3.02 PROTECTION**

- .1 Protect any fittings and surfaces adjacent to work by covering or masking.

### **3.03 PREPARATION**

- .1 Remove loose plaster in the areas as indicated on drawing].
- .2 Clean out plaster between wood lath, and brush out loose sand.
- .3 Bevel edges of existing plaster to accept new plaster repair.

### **3.04 INSTALLATION**

- .1 Remove dust and other foreign materials before proceeding with plaster repair.

### **3.05 APPLICATION**

- .1 Ensure that plaster finish follows original methods to maintain appearance of original work.
- .2 Do plaster work to ASTM C 842, unless otherwise specified.
- .3 Scratch Coat:
  - .1 Apply specified scratch coat with trowel, using sufficient pressure to force it between gaps of lath. Ensure even surface.
  - .2 Scratch surface with broom when initial set is obtained (2-4 days).
  - .3 Keep scratch coat damp for 3 days.
  - .4 Cure scratch coat 10 days in ventilated surroundings.
- .5 Finish coat:
  - .1 Wet intermediate brown coat thoroughly. Eliminate standing water from surface.
  - .2 Apply specified finish coat to minimum 3 mm thickness.
  - .3 Smooth finish coat with wood trowel to achieve desired texture and appearance.
  - .4 Cure 10 days.
  - .5 Trowel patch work to smooth surface, even with adjacent work.

### **3.06 CLEANING**

- .1 Remove droppings and splashings, immediately, using clean sponge and water.

### **3.07 PROTECTION**

- .1 Protect finished adjoining work, during execution of plaster work, with polyethylene sheets or building paper.
- .2 Remove surplus material, tools, equipment and debris from work area on completion of work.

### **3.08 CURING**

- .1 Cure plaster for 10 days.
- .2 Maintain temperature between 13 and 21 degrees C.
- .3 Maintain relative humidity as specified by manufacturer

**END OF SECTION**

## **1 GENERAL**

### **1.01 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM D 1535-[13], Standard Practice for Specifying Colour by the Munsell System.
  - .2 ASTM D 1729-[96(2009)], Standard Method for Visual Appraisal of Colour Differences of Diffusely Illuminated Opaque Materials.
- .2 Master Painters Institute (MPI)
  - .1 Maintenance Repainting Manual [current edition], Master Painters Institute (MPI) including Identifiers, Evaluation, Systems, Preparation and Approved Products List.
- .4 National Fire Code of Canada (NFC), [2015].
- .5 United States Federal Standards, issued by General Services Administration.
  - .1 Federal Standard 595C - Colors Used in Government Procurement.

### **1.02 DEFINITIONS**

- .1 Interior surfaces: refers to surfaces of a historic structure which is environmentally protected from exterior weather, not only from wet conditions of rain or snow but also from low temperature conditions below freezing point.
- .2 Interior paints: painting materials intended for use exclusively on interior surfaces either alone or with primer or undercoater.
- .3 Period paint samples: paint chips obtained from paint coatings on historic structures for purpose of paint analysis, colour matching and other paint information recording.
- .4 Paint gloss: sheen rating of applied paint.

### **1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section [01 33 00 - Submittal Procedures].
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for [paints and coating products] and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit [2] copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements [01 35 43 - Environmental Procedures] [02 81 01 - Hazardous Materials].
- .3 Samples:
  - .1 Submit full range of coating colour sample matches for review and selection.
  - .2 Submit [2] one-litre samples of each paint delivered to site:
    - .1 [1] sample from manufacturer's containers.
    - .2 [1] sample from painter's pot.
    - .3 Take samples in presence of Departmental Representative.
- .4 Source Quality Control Submittals:
  - .1 Submit records of paint information on period paints.

- .5 Sustainable Design Submittals:
  - .1 .2 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

#### **1.04 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section [01 78 00 - Closeout Submittals].
- .2 Operation and Maintenance Data: submit operation and maintenance data for [paints and coatings] for incorporation into manual.
  - .1 Provide records of products used. List products in relation to finish system and include following:
    - .1 Product name, type and use (e.g. materials and location).
    - .2 Manufacturer's product number.
    - .3 Colour code numbers.
    - .4 MPI Environmentally Friendly classification system rating.
    - .5 Manufacturer's Material Safety Data Sheets.
- .3 Submit maintenance record of painting work.

#### **1.05 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials:
  - .1 Submit one, 1 litre can of each type and colour of finish coating. Identify type and colour in accordance with established colour schedule and finish system.

#### **1.06 QUALITY ASSURANCE**

- .1 Regulatory Agency Sustainability Approvals:
  - .1 Compliance Report indicating requirement to purchase energy efficient and environmentally friendly products.
  - .2 Conform to applicable standards and requirements for interior repainting work including cleaning, preparation and priming.
  - .3 Retain purchase orders, invoices and other documents and produce when requested by Departmental Representative.
- .2 Qualifications:
  - .1 Contractor: Work to be undertaken by skilled and qualified personnel
  - .3 Apprentices: work under direct supervision of qualified journey person in accordance with applicable trade regulations.
- .3 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Provide following mock-ups:
    - .1 Existing Heater Infill and new Baseboard Mounting.
  - .3 Prepare a full-size mock-up of designated interior surface including baseboards, showing selected colours, number of coats, and quality of work.
  - .4 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with work.
  - .5 When accepted, mock-up demonstrates minimum standard for this work. Mock-up may remain as part of finished work.

## **1.07 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Labels: to indicate:
    - .1 Type of paint or coating.
    - .2 Compliance with applicable standard.
    - .3 Colour number in accordance with established colour schedule.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect paints and coatings.
  - .3 Keep areas for storage, cleaning and preparation, clean and orderly.
  - .4 Remove paint materials from storage in quantities required for same day use.
  - .5 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
  - .6 Store materials and equipment within temperature range between 7 degrees C to 30 degrees C.
  - .7 Store materials and supplies away from heat generating devices and sensitive materials above minimum temperature as recommended by manufacturer.
  - .8 Replace defective or damaged materials with new.
- .4 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site daily.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.8 AMBIENT CONDITIONS**

- .1 Heating, Ventilation and Lighting:
  - .1 Perform work when ambient air and substrate temperatures are above 10 degrees C for 24 hours before, during and after paint application and until paint has cured.
  - .2 Ventilate. Where required, provide continuous ventilation for 7 days after completion of application of paint.
  - .3 Co-ordinate use of existing ventilation system with Departmental Representative. Ensure its operation during and after application of paint as required.
  - .4 Provide temporary ventilation and heating equipment where permanent facilities are not available.
  - .5 Provide supplemental ventilation and heat to meet minimum requirements. Use of gas-fired appliances is not permitted.
  - .6 Temperature, Humidity and Substrate Moisture Content Levels:
    - .1 Do not perform repainting work when:
      - .1 Ambient air and substrate temperatures are below 10 degrees C.
      - .2 Substrate temperature is over 32 degrees C.

- .3 Relative humidity is above 85.
- .2 Do not perform repainting work when maximum moisture content of substrate exceeds:
  - .1 15% for wood.
- .3 Apply paint finish in locations unaffected by dust-generating operations.

## **2 PRODUCTS**

### **2.01 MATERIALS**

- .1 Primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, and solvents: in accordance with MPI.
  - .1 Each product from a single manufacturer.
- .2 Paint materials listed in MPI.
- .4 Paints and coatings:
  - .1 Provide fire resistance rating where required by Authorities Having Jurisdiction.
  - .2 Products of single manufacturer.

### **2.02 INTERIOR PAINTING SYSTEMS**

- .1 RIN 6.4 - Wood Panelling and Casework: (partitions, panels, shelving, and millwork).
- .2 RIN 9.2 - Plaster and Gypsum Board: (plaster, gypsum wallboard, drywall, and "Sheetrock type material").

### **2.03 PERFORMANCE CRITERIA**

- .1 Environmental Performance Requirements:
  - .1 Paint products meeting MPI Environmentally Friendly ratings based on VOC (EPA Method 24) content levels.
  - .2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.
  - .3 Paint products meeting legislated VOC content levels.

### **2.04 COLOURS**

- .1 Colour Schedule:
  - .1 Existing interior wood trim and moulding to match existing
  - .2 Existing interior wood to match existing.
  - .3 Existing interior plaster walls: to match existing.
- .2 Obtain written approval from Departmental Representative for change in Colour Schedule.
- .3 First coat in two coat repaint system: tinted slightly lighter colour than top coat to show visible difference between coats.

### **2.05 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Reproduce historic paint colour and gloss level using compatible materials meeting current standards.

- .3 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .4 Where thinner is used, addition not to exceed paint manufacturer's recommendations.
- .5 Do not use kerosene or other organic solvents to thin water-based paints.
- .6 Thin paint for brush or roller application in accordance with paint manufacturer's recommendations.
- .7 Re-mix paint in containers prior to and during application. Ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

## 2.06 GLOSS/SHEEN RATINGS

- .1 Paint gloss: in accordance with following MPI Gloss/Sheen ratings:

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 - matte finish	0 to 5	Maximum 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	Minimum 85
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 specified.

## 2.07 ACCESSORIES

- .1 Obtain approval of Departmental Representative for use of power tools.
- .2 Use tools that do not damage adjacent materials.

## 2.8 SOURCE QUALITY CONTROL

- .1 Maintain records of paint information on period paints; paint material, colour, treatment or finish methods.
- .2 Maintain record information on contemporary coatings, include paint material, colour and paint manufacturer.
- .3 Keep maintenance record of painting work. Indicate detailed work carried out for each area of historic structure[s]. Include methods of surface preparation and paint application with comments as necessary.

### **3 EXECUTION**

#### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for painting in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied.

#### **3.02 PREPARATION**

- .1 Ensure workers are kept safe in accordance with Reviewed Safety Plan.
- .2 Implement safety measures as required in preparation for implementing work.
- .3 Place safety devices and signage in locations as required by Reviewed Safety Plan.

#### **3.03 PROTECTION OF IN-PLACE CONDITIONS**

- .1 Protect existing building surfaces and adjacent structures with non-staining covers, masking against paint spatters, markings and other damage.
- .2 Protect items permanently attached to surfaces: Fire Labels on doors and frames, Historical Sites and Monuments Board (HS&MB) Plaques.
- .3 Protect factory finished products and equipment.
- .4 Remove and safely secure and store light fixtures, surface hardware on doors, and surface mounted equipment, fittings and fastenings prior to undertaking painting operations.
- .5 Move and cover interior furniture and portable equipment as necessary to carry out painting operations. Replace as painting progresses.
- .6 Protect furniture, displays, artifacts, surfaces, window and door and ornamental hardware, in and adjacent to areas of work. Prevent damage and protect from paint drops and spatters.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

#### **3.04 SURFACE PREPARATION**

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Requirements except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare exterior surfaces in accordance with MPI Maintenance Repainting Manual requirements. Refer to manual for specific requirements as follows:
  - .1 Remove dust, dirt, and surface debris by wiping with dry, clean cloths.
  - .2 Wash surfaces with biodegradable detergent and clean warm water using a stiff bristle brush. Remove dirt, oil and surface contaminants. Ensure existing substrate is not damaged by process.



- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and dry thoroughly.
- .5 Use water-based cleaners for surfaces to be repainted using water based paints.
- .4 Clean metal surfaces: remove rust, dirt, oil, grease and foreign substances in accordance with MPI requirements.
  - .1 Remove contaminates from surfaces, pockets and corners: vacuum as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before priming.
- .6 Touch-up, spot prime, and apply primer, paint, or pre-treatment immediately after cleaning.

### 3.05 APPLICATION

- .1 Special Techniques:
  - .1 Apply coating in manner that replicates texture of historic, existing paint coating.
- .2 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .3 Apply paint materials in accordance with paint manufacturer's written application instructions.
  - .1 Apply paint:
    - .1 To adequately prepared surfaces and within moisture limits.
    - .2 When previous coat of paint is dry and adequately cured.
    - .3 In accordance with manufacturer's written instructions.
- .4 Apply paint with brush and roller.
- .5 Brush and Roller Application:
  - .1 Apply paint in a uniform layer using brush and roller suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Brush and roll out runs and sags, and overlap marks.
  - .4 Eliminate roller tracking and stipple by finishing with a brush. Maintain historic appearance.
  - .5 Remove runs and sags from finished work and repaint.
  - .6 Apply final coat of paint with brush.
  - .7 Spray Application:
    - .1 Maintain paint ingredients properly mixed in containers during paint application by intermittent agitation as frequently as necessary.
    - .2 Apply paint in uniform layer, with overlapping at edges of spray pattern.
    - .3 Back roll spray applications and immediately brush out runs and sags.
    - .4 Use brushes to work paint into cracks, crevices and places that are not adequately painted by spray.
    - .5 Brush out entire surface of last coat as it is applied. Ensure correct appearance when cured.
    - .6 Difficult to access places: apply coating with dipping sheepskins and daubers when no other method is practical.
    - .7 Apply paint coats in continuous manner.
    - .8 Allow surfaces to dry and cure between coats for minimum time period as recommended by manufacturer.
    - .9 Minimum dry film thickness of coats: not less than that recommended by manufacturer.
    - .10 Repaint thin spots and bare areas before applying next coat of paint.

- .11 Sand and dust between coats to remove visible defects.
- .12 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents between applications of coats.
- .13 Remove paint from areas exposed to freezing, excess humidity, rain, snow, icing or condensation.
- .14 Finish to doors: includes top, bottom and side edges.
  - .1 Paint surfaces concealed by door hardware.

### 3.06 MECHANICAL/ ELECTRICAL EQUIPMENT

- .1 Unless otherwise noted, repainting to include exposed to view/previously painted exterior mechanical and electrical equipment and components (panels, conduits, piping, hangers, ductwork, fire gongs, etc.).
- .2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with Colour and finish to match existing finish unless otherwise noted or scheduled.
- .3 Do not paint over nameplates or instruction labels.
- .4 Keep sprinkler heads free of paint.
- .5 Do not paint interior transformers and substation equipment.

### 3.07 FIELD QUALITY CONTROL

- .1 Standard of acceptance:
  - .1 When viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:
    - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
    - .2 Soffits: no defects visible from grade at 45 degrees to surface.
    - .3 Final coat: to exhibit uniformity of colour and sheen across full surface.
- .2 Advise Departmental Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved by Departmental Representative.
- .3 Test painted plaster surfaces for alkalinity as required.
- .4 Conduct moisture tests on substrates.
  - .1 Use calibrated electronic moisture meter.
  - .2 Test existing painted concrete floors using simple "Cover patch test" on failed areas.
- .5 Manufacturer Services:
  - .1 Special repainting or recoating system applications:
    - .1 Paint or coating manufacturer to provide certification of 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.

### 3.08 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Reinstall and clean removed items after painting is completed.

- .3 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
  - .1 Clean and restore as directed by Departmental Representative.
- .4 Wipe spills and spots immediately with a damp cloth.
- .5 Minimize use of kerosene and organic solvents to clean up water-based paints.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .7 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 Separate coating products waste in accordance with Waste Management Plan and place in designated areas for recycling.
  - .3 Place materials defined as hazardous or toxic waste in designated containers.
  - .4 Seal and store emptied containers safely away from children for disposal.
  - .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.
  - .6 Treat non-reusable materials as hazardous waste and dispose of legally off site.
  - .7 Place excess cleaners, thinners, solvents and paint in designated containers and dispose of legally off site.
  - .8 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling facility.
  - .9 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials, and debris.
  - .10 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with Federal, Provincial and Municipal regulations.
  - .11 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil-based materials as well as cleaning and protective materials, paints, thinners, paint removers/strippers in accordance with Federal, Provincial and Municipal regulations.
  - .12 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Recycle sediment remaining from cleaning operations in accordance with Federal, Provincial and Municipal regulations.

### **3.09 HARDWARE RE-INSTALLATION**

- .1 Clean and re-install hardware items removed and stored previous to commencement of the Work.
- .2 Re-install hardware items in original locations.

### **3.10 PROTECTION**

- .1 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.
- .2 Remove paint splashings on exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .3 Protect completed work from paint droppings. Use non-staining coverings.
- .4 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

.5 Remove protective coverings and warning signs as soon as practical after operations cease.

**END OF SECTION**

## **-General**

### **1.1 REFERENCES**

- .1 Health Canada / Workplace Hazardous Materials Information System, (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .2 Master Painters Institute, (MPI).
  - .1 MPI Architectural Painting Specifications Manual.
  - .2 MRM, Maintenance Repainting Manual by the Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.

### **1.2 QUALITY ASSURANCE**

- .1 Engage qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" for painting work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .2 Conform to latest MPI requirements for painting work including preparation and priming.
- .3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .4 Other paint materials such as linseed oil, shellac, turpentine, etc. to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and be compatible with other coating materials as required.

### **1.3 ENVIRONMENTAL PERFORMANCE**

- .1 Provide paint products that do not exceed following ratings based on VOC (EPA Method 24) content levels.
  - .1 Levels E3 to E2.

### **1.4 SCHEDULING**

- .1 Submit work schedule for various stages of painting to Departmental Representative for review. Submit schedule minimum of 5 working days in advance of proposed operations.
- .2 Obtain written authorization from Departmental Representative for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about building.

### **1.5 SUBMITTALS**

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

- .1 Match paint look, colour, sheen, texture to existing.
- .2 Submit product data and instructions for each paint and coating product to be used.
- .3 Submit product data for the use and application of paint thinner.
- .4 Submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS).
  - .1 Indicate VOC during application and curing.
- .3 Samples:
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint coating with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 6 mm thick hardboard
  - .3 When approved, samples will become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
  - .4 Submit full range of available colours where colour availability is restricted.
- .4 Manufacturer instructions:
  - .1 Submit manufacturer's installation and application instructions.

## **1.6 DELIVERY, STORAGE, HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, unless more stringent care is required by respective material manufacturer.
- .2 Deliver and store materials in original containers, sealed, with labels intact.
- .3 Labels to clearly indicate:
  - .1 Manufacturer name and address.
  - .2 Type of paint or coating.
  - .3 Compliance with applicable standard.
  - .4 colour number in accordance with established colour schedule.
- .4 Remove damaged, opened and rejected materials from site.
- .5 Provide and maintain dry, temperature controlled, secure storage.
- .6 Observe manufacturer recommendations for storage and handling.
- .7 Store materials and supplies away from heat generating devices.
- .8 Store materials and equipment in a well-ventilated area with temperature range 7 degrees C to 30 degrees C.
- .9 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

- .11 Remove paint materials from storage only in quantities required for same day use.
- .12 . Comply with requirements of WHMIS regarding use, handling storage and disposal of hazardous materials.
- .13 Fire safety requirements:
  - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of inflammable and combustible materials in accordance with the National Fire Code of Canada.

## **1.7 WHMIS**

- .1 Comply with WHMIS requirements regarding handling and use of painting products.

## **1.8 SITE REQUIREMENTS**

- .1 Heating, ventilation and lighting:
  - .1 Ventilate enclosed spaces.
  - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .3 Provide continuous ventilation for 7 days after completion of application of paint.
  - .4 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
  - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, humidity and substrate moisture content levels:
  - .1 Unless specifically pre-approved by respective product manufacturer, perform no painting work when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer prescribed limits.
    - .4 Relative humidity is above 85%.
  - .2 Perform no painting work when maximum moisture content of substrate exceeds:
    - .1 12% for gypsum board, including taped/filled joints.
  - .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter.
- .3 Surface and environmental conditions:

- .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
- .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint only when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes only when conditions for entire period of application fall within manufacturer's recommendations.

## **1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .3 Material which cannot be re-used must be treated as hazardous waste and disposed of in an appropriate manner.
- .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .5 Observe and adhere to following procedures to reduce amount of contaminants entering waterways, sanitary/storm drain systems or into ground:
  - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
  - .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 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .7 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by employees, individuals or organizations for verifiable re-use or re-manufacturing.
- .8 Close and seal tightly partly used containers and store protected in well ventilated fire-safe area at moderate temperature.

## **1.10 CLOSEOUT SUBMITTALS**

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.



- .2 Data:
  - .1 Provide following data for each paint product installed for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
    - .1 Product name, type and use.
    - .2 Manufacturer product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification system rating.

## **- PRODUCTS**

### **1.11 MATERIALS**

- .1 Paint materials listed in the latest edition of the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems to be products of single manufacturer to ensure compatibility.
- .3 Only qualified products with "Environmentally Friendly" rating are acceptable for use on this project, subject to verification of MSDS data and approval by DCC Representative. Refer to Environmental Performance Requirements for VOC levels.

### **1.12 COLOURS**

- .1 Selection of colours will be from manufacturer's full range of colours with colour matching to existing interior colours confirmed in place by Departmental Representative prior to commencement of Project painting.
- .2 Where specific products are available in restricted range of colours, selection based on limited range.
- .3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

### **1.13 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Departmental Representative for site tinting of painting materials.
- .2 Do not thin or dilute paints.
- .3 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment and colour and gloss uniformity.

### **1.14 GLOSS/SHEEN RATINGS**

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:
  - .1 Gloss @ 60 degrees Sheen @ 85 degrees
    - .1 Gloss Level 3: 10 to 25 units and 10 to 35 units
    - .2 - (Eggshell Finish)
  - .2 Gloss Level 5: 35 to 70 units
    - .1 - (Semi-Gloss Finish)

## **1.15 INTERIOR PAINTING SYSTEMS**

### **– NEW SURFACES**

- .1 General: all painting to Premium Grade (minimum 3 coats) in accordance with MPI Painting Specification Manual.
- .2 Standing/running trim, chair rails, and windowsills shall be painted to match existing. Provide samples before commencing work.
  - .1 Coordinate finishing of items prior to installation wherever practical.

## **1.16 INTERIOR PAINTING SYSTEMS**

### **– EXISTING SURFACES**

- .1 General:
  - .1 Use MRM systems for preparation and re-painting of existing painted surfaces.
  - .2 All painting to Premium Grade in accordance with MRM.
- .2 Use MRM systems matching systems described under Interior Painting Systems - New Surfaces for painting of like surfaces.

### **- Execution**

## **1.17 MANUFACTURER INSTRUCTIONS**

- .1 Compliance: comply with manufacturer written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions and data sheet.

## **1.18 GENERAL**

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer written application instructions.

## **1.19 EXAMINATION**

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
  - .1 Gypsum board, including taped/filled joints: 12%.
  - .2 Wood: 15%.

## **1.20 PREPARATION**

- .1 Protection:
  - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
  - .2 Protect factory finished products and equipment.
- .2 Surface preparation:
  - .1 Generally arrange and schedule painting operations prior to installation of wall mounted items to avoid need for masking of and cutting around wall mounted items.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of DCC Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Architectural Painting Specification Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming and wiping with dry clean cloths.
  - .2 Wash existing surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or vacuum cleaning.
- .7 Touch up of shop primers with primer as specified.

- .8 For areas of re-paint required to tie existing work into new work clean and prepare surfaces in accordance with MRM requirements. Refer to MRM in regard to specific requirements and as follows:
  - .1 Assess degree of surface deterioration (DSD) using MPI Identifiers and Assessment criteria indicated in MRM. MPI DSD ratings and descriptions are as follows:

Condition	Description
DSD-0	Sound Surface (includes visual aesthetic defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes, scratches, 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 other trades).

- .9 Do not apply paint until prepared surfaces have been reviewed by Departmental Representative.

## **1.21 APPLICATION**

- .1 Apply paint by brush or roller. Conform to manufacturer application instructions unless specified otherwise.
- .2 Brush and roller application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and re-paint.
- .3 Spray application: not permitted.
- .4 Apply coats of paint continuous film of uniform thickness. Re-paint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.

- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .8 Finish closets and alcoves as specified for adjoining rooms.
- .9 Finish top, bottom, edges and cut-outs of doors after fitting as specified for site-painted door surfaces.

## **1.22 MECHANICAL/ELECTRICAL**

### **EQUIPMENT**

- .1 Paint finished area exposed conduits, piping, hangers, and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .3 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .4 Do not paint over nameplates.

## **1.23 SITE TOLERANCES**

- .1 Walls: - no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

## **1.24 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Clean and re-install hardware items removed before undertaken painting operations.
- .3 Remove protective coverings and warning signs as soon as practical after operations cease.
- .4 Remove paint splashes on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .5 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.
- .6 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by DCC Representative.
- .7 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                SUBMITTALS**

- .1        Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Closeout Submittals:
  - .1        Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
  - .2        Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
  - .3        Operation data to include:
    - .1        Description of systems and their controls.
    - .2        Operation instruction for systems and component.
    - .3        Description of actions to be taken in event of equipment failure.
  - .4        Maintenance data to include:
    - .1        Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
    - .2        Data to include schedules of tasks, frequency, tools required and task time.
  - .5        Performance data to include:
    - .1        Equipment performance verification test results.
  - .6        Site records:
    - .1        Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
    - .2        Transfer information to reproducibles, revising reproducibles to show work as actually installed.
    - .3        Use different colour waterproof ink for each service.
    - .4        Make available for reference purposes and inspection.
  - .7        As-built drawings:
    - .1        Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.
    - .2        Identify each drawing in lower right-hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
    - .3        Submit to Departmental Representative for approval and make corrections as directed.
    - .4        Perform testing, adjusting and balancing using as-built drawings.
    - .5        Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.
  - .8        Submit copies of as-built drawings for inclusion in final TAB report.

**1.2 QUALITY ASSURANCE**

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- .1 Waste Management and Disposal:
  - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**Part 2 Products**

**2.1 Not Used**

**Part 3 Execution**

**3.1 PAINTING REPAIRS AND RESTORATION**

- .1 Do painting in accordance with Section 09 91 23 - Interior Painting.
- .2 Prime and touch up marred finished paintwork to match original.
- .3 Restore to new condition, finishes which have been damaged.

**3.2 CLEANING**

- .1 Clean interior and exterior of all systems.

**3.3 DEMONSTRATION**

- .1 Supply labour, material, and instruments required for testing.
- .2 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, troubleshooting and servicing of all systems and equipment during regular work hours, prior to acceptance.
- .3 Use operation and maintenance manual, as-built drawings, and audio-visual aids as part of instruction materials.
- .4 Instruction duration time requirements as specified in appropriate sections.

**3.4 PROTECTION**

- .1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

**END OF SECTION**

**Part 1            General**

**1.1               RELATED SECTIONS**

- .1        Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

**1.2               REFERENCES**

- .1        American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME).
  - .1        ANSI/ASME B31.1- Power Piping.
- .2        American Welding Society (AWS).
  - .1        AWS C1.1-, Recommended Practices for Resistance Welding.
  - .2        AWS Z49.1-, Safety Welding, Cutting and Allied Process.
  - .3        AWS W1-, Welding Inspection Handbook.

**1.3               QUALIFICATIONS**

- .1        Welders:
  - .1        Welding qualifications in accordance with CSA B51.
  - .2        Use qualified and licensed welders possessing certificate for each procedure performed from authority having jurisdiction.
  - .3        Furnish welder's qualifications to Departmental Representative.
  - .4        Each welder to possess identification symbol issued by authority having jurisdiction.
  - .5        Certification of companies for fusion welding of aluminum in accordance with CSA W47.2.

**1.4               QUALITY ASSURANCE**

- .1        Registration of welding procedures in accordance with CSA B51.
- .2        Copy of welding procedures available for inspection.
- .3        Safety in welding, cutting and allied processes in accordance with CSA-W117.2.

**1.5               WASTE MANAGEMENT AND DISPOSAL**

- .1        Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal, and with the Waste Reduction Workplan.
- .2        Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3        Divert unused metal materials from landfill to metal recycling facility.



**Part 2 Products**

**2.1 ELECTRODES**

- .1 Electrodes: in accordance with CSA W48 Series.

**Part 3 Execution**

**3.1 WORKMANSHIP**

- .1 Welding: in accordance with ANSI/ASME B31.1.

**3.2 INSTALLATION REQUIREMENTS**

- .1 Identify each weld with welder's identification symbol.
- .2 Fittings:
  - .1 NPS 2 and smaller: install welding type sockets.
  - .2 Branch connections: install welding tees or forged branch outlet fittings.

**3.3 INSPECTION AND TESTS - GENERAL REQUIREMENTS**

- .1 Review weld quality requirements and defect limits of applicable codes and standards with Departmental Representative before work is started.
- .2 Formulate "Inspection and Test Plan" in co-operation with Departmental Representative
- .3 Do not conceal welds until they have been inspected, tested and approved by inspector.
- .4 Provide for inspector to visually inspect welds during early stages of welding procedures in accordance with Welding Inspection Handbook. Repair or replace defects as required by codes and as specified.

**3.4 EXAMINATIONS AND TESTS**

- .1 Visual examinations: include entire circumference of weld externally.
- .2 Failure of visual examinations:
  - .1 Grind off welds and redo to satisfaction of Departmental Representative.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .3 Section 01 78 00 - Closeout Submittals.

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.2 No.46-, Electric Air-Heaters.
- .2 Underwriters' Laboratories (UL) Inc.
  - .1 UL 1042-, Electric Baseboard Heating Equipment.

**1.3 PRODUCT DATA**

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data sheets for baseboard convectors. Include:
  - .1 Product characteristics.
  - .2 Performance criteria.
  - .3 Mounting methods.
  - .4 Physical size.
  - .5 kW rating, voltage, phase.
  - .6 Cabinet material thicknesses.
  - .7 Limitations.
  - .8 Colour and finish.
- .3 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, cleaning procedures.

**1.4 CLOSEOUT SUBMITTALS**

- .1 Submit operation and maintenance data for baseboard convectors in accordance with Section 01 78 00 - Submittal Procedures.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

- .4 Divert unused metal and wiring materials from landfill to metal recycling facility.
- .5 Collect, package and store existing convectors units for either reuse or recycling and return to recycler in accordance with Waste Management Plan.

## **Part 2 Products**

### **2.1 BASEBOARD CONVECTORS**

- .1 Heaters: to CSA C22.2 No.46, UL 1042, wattage density as indicated.
  - .1 Element through-type fitted with convector vanes and resistor wire enclosed in mineral insulation in sheath.
- .2 Element locked to cabinet and supported with non-metallic supports to allow for expansion.
- .3 Cabinet: steel 0.8 mm thick finished in baked enamel or powder coat finish, colour ivory with integral air deflector for diffusion.
- .4 Approved wiring channel for interconnection of heaters and components.
- .5 Knock-outs for 12 mm dia. conduit connection.

### **2.2 CONTROLS**

- .1 Integral thermostats: To control load as indicated.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Attach baseboard heaters to wall with wood-screws.
- .2 Make power and control connections.

### **3.2 FIELD QUALITY CONTROL**

- .1 Ensure that heaters and controls operate correctly.
- .2 Commission Heaters as per section 01 9100 Commissioning

**END OF SECTION**

**Part 1 CONTRACT**

- .1 The term “provide” means supply and installation of referenced item, work and/or system including all labour, materials, equipment, services, coordination with others, programming, verification, commissioning, warranty and other manufacturer, codes, standards and contract documents required elements for a complete and operational system.
- .2 Provide all systems as outlined in the specifications and indicated in the drawings, unless specifically noted that the material/equipment, labour or other services are not in scope.
- .3 The requirements of this specifications are in addition to those specified within the general conditions and other sections of the contract documents. Where the specifications and drawings contradict each other, request clarification prior to pricing, and when clarification is not formally communicated in an addendum to all bidders, allow for the most expensive option.

**Part 2 CODES AND PERMITS**

- .1 Obtain and pay for all permits and licenses.
- .2 Provide installation as per the current edition of the Canadian electrical code, current edition of the BC building code, relevant municipality bylaws and the electrical inspection authority.

**Part 3 EQUIPMENT AND MATERIALS**

- .1 All supplied materials shall be in new condition and must bear a certification mark indicating that the product was tested and has met the certification requirements for use in Canada. If required, obtain and pay for field certification of equipment.

**Part 4 WARRANTY**

- .1 Provide warranty for all installation to be protected against defects in materials and workmanship for a period of not less than 1 year after substantial completion. Electrical contractor must cover all costs of repair and replacement of defective materials and workmanship including but not limited to parts, labor, travel expenses, expendable materials and other items required for a repair.
- .2 Provide standard manufacturer’s warranty for all equipment provided.

**Part 5 SUBSTITUTIONS OR ALTERNATES**

- .1 The contractor is responsible for confirming the acceptability of physical dimensions and criteria(s) described within the contract documents for the product, material or equipment being substituted. In the event that the physical dimensions and/or criteria(s) described within the contract documents is found unacceptable during construction, it is the contractors responsibility to rectify the condition at the contractor’s cost.

**Part 6 TENDER COORDINATION**

- .1 Review mechanical drawings and specifications to confirm the scope of work and impact on electrical works. Include reasonable cost in the tender sum for complications and additional work described therein.
- .2 Include all costs in the tender sum required to:
  - .1 Provide alternate routes of conduits and cables to avoid mechanical systems, architectural and structural restrictions/limitations.
  - .2 Firestop and smoke seal all penetrations (even penetrations within the same floor plate)

**Part 7 CONSTRUCTION COORDINATION**

- .1 Electrical drawings are diagrammatic in nature and do not indicate all required components to make the system complete and operational. Update as-built drawings to indicate actual install.
- .2 Upon direction from departmental representative, move electrical device (prior to wiring) within 10 feet from location shown on drawings at no additional cost.
- .3 **Contact departmental representative prior to wiring for a site walkthrough to confirm acceptance of electrical device locations.**
- .4 Coordinate with existing millwork and existing furniture to ensure that device locations, mounting heights and other electrical systems (such as cable routing) do not conflict with existing millwork and furniture layout. Provide adjustment at no additional cost where such intent is not met or is not acceptable to the departmental representative.

**Part 8 DEMOLITION SCOPE**

- .1 Items to be removed, and removed & relocated are shown for general pricing purpose only. In base tender pricing, the contractor must allow for removal and disposal of other electrical devices that may not be shown on plans including junction boxes, wiring, and conduits above accessible ceiling spaces and walls. Extra will not be considered for reasonable demolition and disposal of electrical devices in the area of renovation.
- .2 Remove and reinstate equipment and provide supports for existing equipment to facilitate construction efforts.
- .3 Where electrical devices on existing concrete columns or concrete walls are indicated to be removed, provide stamped steel cover plates to suit gang capacity.
- .4 Update panelboard schedule to reflect final condition/circuiting.

**Part 9 ROUGH-IN MOCKUP**

- .1 Provide rough-in mockup of electric baseboard heater for two different conditions (no radiator and radiator present) and notify departmental representative and receive approval of electrical device location and heights prior to proceeding with work. Approval does not remove electrical contractor's responsibility to coordinate with millwork, other trades, other consultant's drawings, or notes within electrical drawings.

**Part 10 SHOP DRAWINGS**

- .1 Submit shop drawings for the following items:
  - .1 Electric baseboard heater
  - .2 Panelboard
  - .3 Pending - meter sockets
  - .4 Pending - exterior kiosk c/w main distribution switchboard
  - .5 Firestops

**Part 11 PROJECT RECORD DRAWINGS**

- .1 Provide one set of full size electrical drawings on site record site changes, site instructions, change orders, any other alternations, conduit routing, fire alarm device addresses and data outlet addresses on the drawings. Hand over digital record drawings to engineer and hardcopy to departmental representative.
- .2 Provide record drawings in pdf format with all the changes incorporated. Hand over record drawings to departmental representative for final review and conversion to AutoCAD 2021.

**Part 12 MECHANICAL SYSTEM COORDINATION**

- .1 Wire and connect line voltage controls supplied by others for mechanical equipment. Coordinate location of line voltage controls supplied by others as such equipment are not shown on plans.

**Part 13 NAMEPLATES**

- .1 Provide and install laminated plastic nameplates with engraved letters on the following equipment(s):
  - .1 Panelboard
  - .2 Meter Socket
  - .3 Main breaker in Panelboard

**END OF SECTION**

**Part 1            GENERAL**

- .1      Provide ULC or cUL listed firestop for all penetrations in fire rated assemblies in accordance with British Columbia Building Code 2018, latest codes, standards and requirements of the authorities holding jurisdiction.
- .2      Firestop and smoke seal all penetrations (even penetrations within the same floor plate)

**END OF SECTION**

**Part 1            GENERAL**

- .1        Provide seismic restraints in accordance with the latest British Columbia Building Code, codes, standards, and requirements of the authorities holding jurisdiction.
- .2        Hire services of a registered professional in the field of seismic design to provide the following:
  - .1        Installation details for support and bracing of service mast and conduits to be mounted on existing building.
  - .2        A digital copy of all the site reviews performed by the registered professional with a letter stating compliance
  - .3        Submit signed and sealed schedule 'S' letters of assurance

**END OF SECTION**



**Part 1            GENERAL**

- .1        All wall and ceiling outlet boxes in this project must be non-combustible (metallic).  
No exceptions.**
- .2        Unless otherwise specified, each box is to be CSA certified, suitable in all respects for the application, single or multi-gang as required, and complete with suitable securing lugs, connectors suitable for the connected conduit, knockouts, and, where necessary, suitable plaster rings, concrete rings, covers and any other required accessory.**
- .3        The size and arrangement of outlet boxes are to suit the device which they serve.**

**END OF SECTION**

**Part 1 GENERAL**

- .1 Size of neutral conductor to match size of phase conductors; no exceptions. Do not share neutral conductors with multiple circuits except as indicated on plans.
- .2 Branch Wiring
  - .1 Size branch wiring as per code to suit size of overcurrent protection, or as indicated on plans, whichever is larger, but not less than #12 AWG copper in all areas, and **not less than #10 AWG copper for 20A breakers (mandatory)**. Minimum 600V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE, Non Jacketed. Aluminum branch wiring not acceptable under any circumstance.
  - .2 Provide AC90 or wiring in conduit in all areas. NMD90 not acceptable.
  - .3 All wiring shall be concealed in new or existing wall, ceiling or floor unless indicated on drawings. Wiring in exposed surface mounted conduit acceptable in service areas and basement level only.
- .3 *Feeders:*
  - .4 **All feeders must be wiring in conduit as indicated in the drawings. TECK90 and ACWU90 is not acceptable in this project.**
  - .5 Install feeders in trenches in accordance with local codes, utility standards and bylaws.
  - .6 Substitution of aluminum *Feeder* in lieu of copper *Feeder* is acceptable provided the following conditions are met at no additional cost:
    - .1 the substituted *Feeder* must have an ampacity equivalent or larger than the specified copper *Feeder* ampacity,
    - .2 have a voltage drop less than 2% between the source panel and panelboard being fed,
    - .3 the conduit sizes are increased to maintain equivalent conduit fill,
    - .4 equipment lugs or connection terminals are marked to accept aluminum conductors,
- .4 **All wiring shall be concealed in new or existing wall, ceiling or floor unless indicated on drawings. Wiring in exposed surface mounted conduit acceptable in service areas and basement level only.**
- .5 **Where it is determined that the wiring cannot be concealed in walls, acquire special permission to install Nonmetallic Surface Raceway, Legrand Wiremold Eclipse series or better sized to suit the number of cables and complete with all accessories, fittings, mounting hardware, components and finishing materials for a complete and operational system acceptable to the departmental representative. The cost for such solution is to be carried in the tender base bid. Extras for such solutions will not be entertained after tender award.**

END OF SECTION

## Part 1 PRODUCTS

- .1 *Manufactured Grounding Electrode (Ground Rod Electrode)* - copper clad solid steel, 20 mm diameter, minimum 3m in length, complete with driving cap and pointed bronze tip.
- .2 *Grounding Conductor* - bare or green insulated stranded copper, un-tinned, soft annealed, minimum #1 in consideration of durability.
- .3 *Bonding Conductor* - copper or aluminum conductor matching phase conductor type, and sized in accordance with Table 16 and Section 10 of the latest applicable Canadian Electrical Code.
- .4 *Bonding Jumper* - copper conductor, and sized in accordance with Table 16 and Section 10 of the latest applicable Canadian Electrical Code.
- .5 *Equipotential Bonding Conductor* - minimum #6 copper.
- .6 *Ground Bus* - copper, size as required but no less than 300mm in length, complete with insulated supports, fastenings, connectors.

## Part 2 EXECUTION

- .1 *Manufactured Grounding Electrode (Ground Rod Electrode):*
  - .1 Provide two *Manufactured Grounding Electrode (Ground Rod Electrode)* spaced not less than 3m apart, driven 300mm into the ground and interconnected with a *Grounding Conductor*.
  - .2 Do not bend, cut, or modify *Manufactured Grounding Electrode (Ground Rod Electrode)*.
- .2 Ground Electrode System:
  - .1 Provide dedicated *Grounding Conductor* sized 1/0 AWG bare copper from *Ground Bus* to *Manufactured Grounding Electrode (Ground Rod Electrode)*.
  - .2 Provide dedicated *Grounding Conductor* sized 1/0 AWG bare copper from *Ground Bus* to neutral bus in the *Main Service Entrance Board*.
  - .3 Confirm ground resistance meets or exceeds Canadian Electrical Code minimum requirements.
  - .4 Provide protection from mechanical damage. Raceways or sleeves constructed of magnetic materials used to enclose *Grounding Conductors* shall be connected to the grounding conductor at both ends.

- .3 Bonding:
  - .1 Provide *Bonding Conductors* as per the latest edition of the Canadian Electrical Code except as noted below.
  - .2 Bonding provided through metallic conduits is not acceptable under any circumstance. Run *Bonding Conductor* inside conduit.
  - .3 Provide *Bonding Jumpers* as per the latest edition of the Canadian Electrical Code.
  - .4 Provide *Equipotential Bonding Conductor* from *Ground Bus* to non-electrical equipment such as metal water piping, metal waste collection piping, metal gas piping, metal frame of building, metal siding and other exposed metal structures part of the building.
- .4 Grounding and Bonding Connections:
  - .1 Perform all required secondary electrical work grounding and bonding work in accordance with the requirements of governing Codes and Standards, including the Electrical Safety Authority.
  - .2 Install connectors in accordance with manufacturer's instructions.
  - .3 Use mechanical connectors for grounding connections to equipment provided with lugs.
  - .4 Install system and circuit grounding connections to neutral of secondary system.
  - .5 Bond metallic conduits, boxes, cable tray, ducts, and non-current carrying metal parts of equipment together to form a continuous ground system. In electrical equipment rooms, solidly bond circuits, panelboards, conduits, equipment enclosures, and other equipment to perimeter ground bus using bronze connectors and hardware.
  - .6 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centers, starters, control panels, building steel work, generators, elevators and escalators, distribution panels, outdoor lighting, cable trays.
  - .7 Install system and circuit grounding connections to neutral of secondary system.

**END OF SECTION**

**Part 1            GENERAL**

- .1      Minimum 10,000 symmetrical interrupting capacity or as required for the series rating of the distribution system, or as indicated on plans and specifications, whichever is higher.
- .2      In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.
- .3      Ampacity, voltage rating, phase, number of wires, branch circuit breakers and main circuit breaker if applicable as indicated on plans for all equipment.
- .4      Main breaker separately mounted on top or bottom of equipment to suit cable entry.
- .5      Copper bus complete with full sized neutral bus.
- .6      Flush or surface mount enclosure and trims as indicated on plans.
- .7      Panelboard – suitable for molded case bolt-on type circuit breakers, hinged and lockable doors, Eaton PRL1a series or equivalent. Service entrance rated where applicable.

**END OF SECTION**

**Part 1 GENERAL**

- .1 Electric baseboard heaters – high-end Stelpro Bella series. Alternates not acceptable as this baseboard heater has been specifically vetted for this project.**
  - .1 Wattage as per plans at rated voltage of 240V
  - .2 Epoxy-polyester powder coated 11-gauge extruded aluminium with molded and curved end-caps,
  - .3 Stainless steel sheathed element with boxed aluminium fins,
  - .4 Floating nylon sleeves at each end to eliminate expansion and contraction noises
  - .5 Heater complete with built-in mechanical or electronic thermostat
  - .6 Custom color finish for each heater to be determined by departmental representative during shop drawing review stage
- .2 Electric heaters wattages indicated is the rated wattage at 240V.
- .3 All electric heaters are to be complete with automatic reset high limit temperature control.
- .4 Provide electric heaters with wattages as indicated on plans, and complete with built-in thermostat.
- .5 Prior to ordering any materials, confirm the following:
  - .1 Confirm that the physical dimensions of the electric heaters will fit in the space indicated on plans and does not conflict with doors, windows, walls or other building elements.
- .6 Prior to any installation, confirm and maintain the following Canadian electrical code requirements and project requirements:
  - .1 1000mm between sink, tub or shower and electric baseboard heater unless protected by a GFCI breaker.
  - .2 1000mm between sink and thermostat unless protected by a GFCI breaker.
  - .3 1000mm between tub or shower and thermostats, or 500mm if protected by a GFCI breaker.
  - .4 Coordinate location of electric heaters with departmental representative prior to rough-in.

**END OF SECTION**