

**Fisheries and Oceans Canada  
Pachena Point Lighthouse  
Tower Refurbishment  
Canadian Coast Guard**

**Tender Documents and  
Technical Specifications**

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Canadian Coast Guard

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**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 14 00 Work Restrictions.

**1.2                WORK COVERED BY CONTRACT DOCUMENTS**

- .1            Work of this Contract comprises refurbishment of the Pachena Point Lighthouse Tower, located on the west coast of Vancouver Island.
- .2            Site is located approximately 12 km south of Bamfield on the West Coast Trail within the Pacific Rim National Park.
- .3            Site access by helicopter, ship and high line, and on foot via the trail.
- .4            The station is in operation and staff are on site.
- .5            The lightstation tower is a 'Recognized Federal Heritage Building' and the refurbishment must meet the 'Standards and Guidelines for the Conservation of Historic Places in Canada'.
- .6            In general, the Project includes:
  - .1            Temporary shoring of wood tower framing and the lantern room, lens pedestal, and Fresnel lens.
  - .2            Jacking of the lantern room, lens pedestal, and Fresnel lens to allow access for the refurbishment work.
  - .3            Repair and replacement of deteriorated or damaged wood framing.
  - .4            Replacement of the building envelope, including rainscreen, wall, windows, and deck membrane.
  - .5            Repairs to vent covers and painting of lantern room to 300mm above floor.

**1.3                TIME OF COMPLETION**

- .1            Commence work immediately upon official notification of acceptance of offer and complete the project within sixteen (16) weeks after contract award.

**1.4                CONTRACTOR USE OF PREMISES**

- .1            Unrestricted use of the immediate area required for construction until Substantial Performance.
- .2            Co-ordinate use of premises under direction of the Departmental Representative, including:
  - .1            Use of the high-line for delivery of materials and equipment by ship. Canadian Coast Guard use of the high-line has priority. The safe working load of the high-line is 450 kg (1000 lbs). The Contractor shall schedule use of the high-line with the Departmental Representative and the site staff. Materials are typically ferried from the main ship by a smaller vessel in order to access the high-line.
  - .2            Use of the landing pad for delivery of personnel, materials and equipment by helicopter. Canadian Coast Guard use of the helipad has priority. The helipad is

rated for a Bell 212. Use of the helipad must be coordinated with the Canadian Coast Guard Regional Operations Centre – Helicopter Division through the Departmental Representative. Contact Departmental Representative at least two (2) days in advance.

.3 Use of the crew house for lodging.

- .3 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .4 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .5 At completion of construction operations condition of existing work: equal to or better than that which existed before new work started.

### **1.5 OWNER OCCUPANCY**

- .1 Owner will not occupy the lightstation tower during entire construction period. Owner will occupy the site for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

### **1.6 EXISTING SERVICES**

- .1 Disruption of existing services is not anticipated to execute this work.
- .2 If interruption of services is required, notify Departmental Representative and obtain required permission.
- .3 Existing equipment located on the main floor must remain operational.
- .4 Communications antennae located on the exterior of the lantern room must remain operational.
- .5 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by the Departmental Representative.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

### **1.7 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.

- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Field Test Reports.
- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

**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                RELATED REQUIREMENTS**

- .1        Section 01 11 00 Summary of Work.
- .2        Section 01 35 43 Environmental Procedures
- .3        Section 01 56 00 Temporary Barriers and Enclosures

**1.2                ACCESS AND EGRESS**

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

**1.3                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 access.
- .3        Where security is reduced by work provide temporary means to maintain security.
- .4        Departmental Representative will assign lodging and sanitary facilities for use by Contractor's personnel. Keep facilities clean.
  - .1        On site lodging and sanitary facilities are available in the crew house.
  - .2        Each side of the crew house (duplex) has three (3) bedrooms with two (2) beds in each bedroom. However, only one (1) side of the duplex is furnished.
  - .3        The crew house has water and electricity.
  - .4        The kitchen has a stove, refrigerator, and microwave. There are two (2) bathrooms with showers.
  - .5        The cost is \$10.00 per person per night payable to the site staff.
  - .6        Use of the crew house shall be scheduled with the Departmental Representative.
- .5        Closures: protect work temporarily until permanent enclosures are completed.
  - .1        Provide scaffolding to enclose lighthouse tower complete with netting and/or shrink wrap. Scaffolding shall be designed in accordance with CSA-S269.2 and sealed by a Professional Engineer registered in the Province of British Columbia.

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

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

**1.5                SPECIAL REQUIREMENTS**

- .1        Carry out noise generating Work Monday to Friday from 8:00 to 17:00 hours. Noise generating Work outside of these hours is at the discretion of the site staff.

- .2 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Ensure Contractor's 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 Coordinate delivery of materials and equipment with Departmental Representative.

**1.6 SECURITY**

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

**1.7 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions. Smoking is not permitted in buildings.

**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 the call of Departmental Representative.
- .2     Prepare agenda for meetings.
- .3     Distribute written notice of each meeting 7 days in advance of meeting date to Departmental Representative.
- .4     Meetings to be held off-site every two (2) weeks. Consultant office is available for project meetings. Contact Consultant to make arrangements.
- .5     Preside at meetings.
- .6     Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7     Reproduce and distribute copies of minutes within 3 days after meetings and transmit to meeting participants and, affected parties not in attendance.
- .8     Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

**1.2                PRECONSTRUCTION MEETING**

- .1     Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2     Departmental Representative, Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3     Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4     Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5     Agenda to include:
  - .1     Appointment of official representative of participants in the Work.
  - .2     Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3     Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4     Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5     Delivery schedule of materials and equipment.
  - .6     Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
  - .7     Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

- .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .11 Monthly progress claims, administrative procedures, photographs, hold backs.
- .12 Appointment of inspection and testing agencies or firms.
- .13 Insurances, transcript of policies.

**1.3 PROGRESS MEETINGS**

- .1 During course of Work and 4 weeks prior to project completion, schedule progress meetings every 2 weeks.
- .2 Contractor, major Subcontractors involved in Work, Departmental Representative and Consultant are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .5 Agenda to include the following:
  - .1 Review, approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding work period.
  - .9 Review submittal schedules: expedite as required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on construction schedule and on completion date.
  - .12 Other business.

**Part 2 Products**

**2.1 NOT USED**

- .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 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

### **1.2 REQUIREMENTS**

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

### **1.4 PROJECT MILESTONES**

- .1 Project milestones form interim targets for Project Schedule.
  - .1 Lifting of lantern room.
  - .2 Demolition of exterior finishes.
  - .3 Structural repairs completed.
  - .4 Wall sheathing completed.
  - .5 Lowering of lantern room.
  - .6 Building envelope completed.
  - .7 Finish painting completed.
  - .8 Interim Certificate (Substantial Completion).

### **1.5 MASTER PLAN**

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

### **1.6 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings, Samples.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Temporary Shoring.
  - .6 Scaffolding.
  - .7 Deconstruct shingles and diagonal sheathing.
  - .8 Wood Framing repairs.

- .9 Siding and Roofing.
- .10 Testing and Commissioning.
- .11 Demobilization.

**1.7 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

**1.8 PROJECT MEETINGS**

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

**Part 2 Products**

**2.1 NOT USED**

- .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.
- .5     Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6     Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7     Verify field measurements and affected adjacent Work are co-ordinated.
- .8     Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9     Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10    Keep one reviewed copy of each submission on site.

### **1.2               SHOP DRAWINGS AND PRODUCT DATA**

- .1     The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2     Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia.
- .3     Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4     Allow 10 working days for Departmental Representative's review of each submission.
- .5     Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within 3 years of date of contract award for project.

- .13 Submit electronic copies of 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.
- .16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .17 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
  - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

### **1.3 SAMPLES**

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

### **1.4 MOCK-UPS**

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

### **1.5 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement as directed by Departmental Representative.



- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints:
  - .1 Number of viewpoints and locations sufficient to document progress of work. Viewpoints and their location as determined by Departmental Representative.
- .4 Frequency of photographic documentation: weekly as directed by Departmental Representative.
  - .1 Existing conditions prior to removal of existing components of the building.
  - .2 New construction before concealment.

**1.6 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1 General**

**1.1 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of British Columbia
  - .1 Workers Compensation Act, RSBC 1996 - Updated 2012.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 10 working days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Results of site specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit electronic copies 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.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 working days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 working days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**1.3 SAFETY ASSESSMENT**

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

**1.4 MEETINGS**

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

## **1.5 PROJECT/SITE CONDITIONS**

- .1 Work at site will involve contact with:
  - .1 Lead paint.
  - .2 Work within a confined space.
  - .3 Work at height.
  - .4 Remote site and wildlife.

## **1.6 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.

## **1.7 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.

## **1.8 COMPLIANCE REQUIREMENTS**

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

## **1.9 UNFORSEEN HAZARDS**

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

## **1.10 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 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 and report directly to and be under direction of site supervisor.

**1.11 POSTING OF DOCUMENTS**

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

**1.12 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.

**1.13 POWDER ACTUATED DEVICES**

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

**1.14 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                REFERENCES**

- .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 humans; or degrade environment aesthetically, culturally and/or historically.
  - .2    Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

**1.2                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 and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2    Submit electronic copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3    Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Departmental Representative.
- .4    Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5    Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6    Include in Environmental Protection Plan:
  - .1    Names of persons responsible for ensuring adherence to Environmental Protection Plan.
  - .2    Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
  - .3    Names and qualifications of persons responsible for training site personnel.
  - .4    Descriptions of environmental protection personnel training program.
  - .5    Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
  - .6    Drawings indicating 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.

- .7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
  - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .8 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .9 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .10 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .11 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .12 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .13 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .14 Pesticide treatment plan to be included and updated, as required.

### **1.3 FIRES**

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

### **1.4 DRAINAGE**

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to 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 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 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 as required.

- .2 Protect trees and shrubs adjacent to construction work, storage areas, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
  - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 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 in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
  - .1 Provide temporary enclosures where indicated and as directed by Departmental Representative.
- .4 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 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .2 Plan: include methods to 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 noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
  - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

**Part 2            Products**

**2.1                NOT USED**

- .1            Not Used.

**Part 3            Execution**

**3.1                CLEANING**

- .1            Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1            Leave Work area clean at end of each day.
- .2            Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3            Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4            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.

**END OF SECTION**



**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 33 00 Submittal Procedures

**1.2                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. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

**1.3                INDEPENDENT INSPECTION AGENCIES**

- .1            Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2            Provide access required for executing inspection and testing by appointed agencies.
- .3            Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4            If defects are revealed during inspection 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.

**1.4                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.

**1.5                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 and cure test samples.

#### **1.6 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.

#### **1.7 REPORTS**

- .1 Submit electronic copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

#### **1.8 MOCK-UPS**

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations as specified in specific Section and acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.
- .7 Mock-ups may remain as part of Work.
- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

**1.9 MILL TESTS**

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

**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                ACTION AND INFORMATIONAL SUBMITTALS**

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

**1.2                INSTALLATION AND REMOVAL**

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

**1.3                WATER SUPPLY**

- .1            Departmental Representative will provide potable water for construction use. Water collection is from a creek and, although water restrictions are not typical at the site, water conservation is required. If additional water is required for construction purposes, it is the responsibility of the contractor to supply this water.

**1.4                TEMPORARY HEATING AND VENTILATION**

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

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

### **1.5 TEMPORARY POWER AND LIGHT**

- .1 Departmental Representative will provide temporary power for construction use at no cost for temporary lighting and operating of power tools, supply of 110 and 240 volts. If 240 volts are required, Contractor is responsible for connecting to existing power supply in accordance with Canadian Electrical Code. Existing generators are rated at 23 kW, one (1) duty generator and one (1) backup generator. Generators do not run continuously at the same time.
- .2 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

### **1.6 TEMPORARY COMMUNICATION FACILITIES**

- .1 Phone lines and cellular coverage are not available on site.
- .2 Provide and pay for temporary communication (satellite phone) necessary for own use.

### **1.7 FIRE PROTECTION**

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties.

- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**END OF SECTION**

**Part 1            General**

**1.1                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 scaffolding to enclose lighthouse tower complete with netting and/or shrink wrap.
- .2        Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre.
- .3        Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

**1.3                GUARD RAILS AND BARRICADES**

- .1        Provide secure, rigid guard rails and barricades around open edges of floors and roofs.

**1.4                WEATHER ENCLOSURES**

- .1        Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
- .2        Design enclosures to withstand wind pressures.
- .3        Provide scaffolding to enclose lighthouse tower complete with netting and/or shrink wrap. Scaffolding shall be designed in accordance with CSA-S269.2 and sealed by a Professional Engineer registered in the Province of British Columbia.

**1.5                DUST TIGHT SCREENS**

- .1        Provide dust tight screens 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.

**1.6                PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

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

**1.7                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 5 working days prior to installation.

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

**1.8 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 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be born by 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.
- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

### **1.3 AVAILABILITY**

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

#### **1.4 STORAGE, HANDLING AND PROTECTION**

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

#### **1.5 TRANSPORTATION**

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

#### **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.

#### **1.7 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

#### **1.8 CO-ORDINATION**

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

#### **1.9 REMEDIAL WORK**

- .1 Refer to Section 01 73 00 - Execution Requirements.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

#### **1.10 FASTENINGS**

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

#### **1.11 FASTENINGS - EQUIPMENT**

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

**1.12 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.

**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                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2        Submit written request in advance of cutting or alteration which affects:
  - .1        Structural integrity of elements of project.
  - .2        Integrity of weather-exposed or moisture-resistant elements.
  - .3        Efficiency, maintenance, or safety of operational elements.
  - .4        Visual qualities of sight-exposed elements.
  - .5        Work of Owner or separate contractor.
- .3        Include in request:
  - .1        Identification of project.
  - .2        Location and description of affected Work.
  - .3        Statement on necessity for cutting or alteration.
  - .4        Description of proposed Work, and products to be used.
  - .5        Alternatives to cutting and patching.
  - .6        Effect on Work of Owner or separate contractor.
  - .7        Written permission of affected separate contractor.
  - .8        Date and time work will be executed.

**1.2                MATERIALS**

- .1        Required for original installation.
- .2        Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

**1.3                PREPARATION**

- .1        Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2        After uncovering, inspect conditions affecting performance of Work.
- .3        Beginning of cutting or patching means acceptance of existing conditions.
- .4        Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5        Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

**1.4                EXECUTION**

- .1        Execute cutting, fitting, and patching to complete Work.
- .2        Fit several parts together, to integrate with other Work.

- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 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 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

**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 regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3      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      Dispose of waste materials and debris.
- .7      Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8      Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9      Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10     Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11     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.
- .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, unless approved by Departmental Representative.
- .6      Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7      Clean and polish glass, hardware, and electrical fixtures. Replace broken, scratched or disfigured glass.

- .8 Remove stains, spots, marks and dirt from decorative work, electrical fixtures, furniture fitments, walls and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .13 Remove dirt and other disfiguration from exterior surfaces.
- .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .15 Sweep and wash clean paved areas.
- .16 Clean equipment and fixtures to sanitary condition.
- .17 Clean roofs, downspouts, and drainage systems.
- .18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

**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 WASTE MANAGEMENT GOALS**

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss the project's waste management goals and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
- .2 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .3 Protect environment and prevent environmental pollution damage.

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 35 43 Environmental Procedures

**1.3 REFERENCES**

- .1 Definitions:
  - .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
  - .2 Class III: non-hazardous waste - construction renovation and demolition waste.
  - .3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
  - .4 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
  - .5 Inert Fill: inert waste - exclusively asphalt and concrete.
  - .6 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
  - .7 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
  - .8 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
  - .9 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.
  - .10 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.
- .11 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .12 Separate Condition: refers to waste sorted into individual types.
- .13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
- .14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.
- .15 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.
- .16 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.
- .17 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.
- .2 Reference Standards:
  - .1 Canadian Construction Association (CCA)
    - .1 CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.

#### **1.4 DOCUMENTS**

- .1 Post and maintain in visible and accessible area at job site, one copy of following documents:
  - .1 Waste Source Separation Program.

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
  - .1 1 electronic copy of Waste Source Separation Program (WSSP).
- .3 Submit prior to final payment the following:
  - .1 Waste Diversion Report, indicating final quantities by material types salvaged for reuse, recycling or disposal in landfill and recycling centres, re-use depots, landfills and other waste processors that received waste materials.

## **1.6 WASTE SOURCE SEPARATION PROGRAM (WSSP)**

- .1 Prepare WSSP prior to project start-up.
- .2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.
- .3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .5 Locate containers to facilitate deposit of materials without hindering daily operations.
- .6 Provide training for contractor, sub-contractors, and workers in handling and separation of materials for reuse and/or recycling.
- .7 Locate separated materials in areas which minimizes material damage.
- .8 Clearly and securely label containers to identify types/conditions of materials accepted and assist contractor, sub-contractors, and workers in separating materials accordingly.
- .9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, and personnel participation.
- .10 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations and security requirements are adhered to.

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

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.

## **1.8 WASTE PROCESSING SITES**

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

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

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.

- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off site processing facility for separation.
  - .3 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

#### **1.10 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, or paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.
  - .2 Waste type of each bin.
  - .3 Total tonnage generated.
  - .4 Tonnage reused or recycled.
  - .5 Reused or recycled waste destination.
- .4 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

#### **1.11 SCHEDULING**

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

### **Part 2 Products**

#### **2.1 NOT USED**

- .1 Not Used.

### **Part 3 Execution**

#### **3.1 APPLICATION**

- .1 Do Work in compliance with WSSP.

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

### **3.2 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.
  - .2 Source separate materials to be reused/recycled into specified sort areas.

### **3.3 DIVERSION OF MATERIALS**

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.
  - .2 Provide instruction on disposal practices.
- .2 On-site sale of reusable or recyclable materials is not permitted.

### **3.4 WASTE DIVERSION REPORT**

- .1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of.

**END OF SECTION**

**Part 1            General**

**1.1                ADMINISTRATIVE REQUIREMENTS**

- .1    Acceptance of Work Procedures:
  - .1    Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    - .1    Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
    - .2    Request Departmental Representative inspection.
  - .2    Departmental Representative Inspection:
    - .1    Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
    - .2    Contractor to correct Work as directed.
  - .3    Completion Tasks: submit written certificates in English that tasks have been performed as follows:
    - .1    Work: completed and inspected for compliance with Contract Documents.
    - .2    Defects: corrected and deficiencies completed.
    - .3    Work: complete and ready for final inspection.
  - .4    Final Inspection:
    - .1    When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
    - .2    When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
  - .5    Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
  - .6    Commencement of Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
  - .7    Final Payment:
    - .1    When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
    - .2    When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
  - .8    Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

**1.2 FINAL CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: 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                ADMINISTRATIVE REQUIREMENTS**

- .1    Pre-warranty Meeting:
  - .1    Convene meeting 2 weeks prior to contract completion with contractor's Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
    - .1    Verify Project requirements.
    - .2    Review warranty requirements.
  - .2    Departmental Representative to establish communication procedures for:
    - .1    Notifying construction warranty defects.
    - .2    Determine priorities for type of defects.
    - .3    Determine reasonable response time.
  - .3    Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
  - .4    Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

**1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, 4 final copies of operating and maintenance manuals in English.
- .3    Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4    Provide evidence, if requested, for type, source and quality of products supplied.

**1.3                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.
  - .1    Identify contents of each binder on spine.
- .4    Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5    Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6    Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7    Text: manufacturer's printed data, or typewritten data.



- .8 Drawings: provide with reinforced punched binder tab.
  - .1 Bind in with text; fold larger drawings to size of text pages.

#### **1.4 CONTENTS - PROJECT RECORD DOCUMENTS**

- .1 Table of Contents for Each Volume: provide title of project;
  - .1 Date of submission; names.
  - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
  - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

#### **1.5 AS -BUILT DOCUMENTS AND SAMPLES**

- .1 Maintain, at site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
  - .1 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.
  - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
  - .1 Do not use record documents for construction purposes.

- .5 Keep record documents and samples available for inspection by Departmental Representative.

## **1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS**

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

## **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.
  - .1 Provide information for re-ordering custom manufactured products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

## **1.8 MAINTENANCE MATERIALS**

- .1 Spare Parts:
  - .1 Provide spare parts, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Deliver to site; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock 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.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 Special Tools:
  - .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.
  - .3 Deliver to site; place and store.
  - .4 Receive and catalogue items.
    - .1 Submit inventory listing to Departmental Representative.
    - .2 Include approved listings in Maintenance Manual.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- .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 for review by Departmental Representative.

## **1.10 WARRANTIES AND BONDS**

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 15 working days before planned pre-warranty conference, to Departmental Representative approval.

- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
  - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
  - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
  - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within [ten] days after completion of applicable item of work.
  - .4 Verify that documents are in proper form, contain full information, and are notarized.
  - .5 Co-execute submittals when required.
  - .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .9 Include information contained in warranty management plan as follows:
  - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
  - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items.
  - .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 9 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
  - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

**1.11 WARRANTY TAGS**

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
  - .1 Type of product/material.
  - .2 Model number.
  - .3 Serial number.
  - .4 Contract number.
  - .5 Warranty period.
  - .6 Inspector's signature.
  - .7 Construction Contractor.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 15 Historic – Splicing of Wood Components.
- .2 Section 06 03 15 Historic – Storage and Protection of Wood.
- .3 Section 06 03 74 Historic – Long-Term Treatment of Wood.
- .4 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
  - .2 Parks Canada, Standards and Guidelines for the Conservation of Historic Places in Canada.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Provide shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Provide drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
- .3 Before proceeding with demolition of load bearing elements and where shoring varies from proposed method shown on the drawings submit for review by Departmental Representative shoring drawings prepared by qualified professional engineer registered or licensed in the Province of British Columbia in Canada showing proposed method.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 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.

### **1.5 SITE CONDITIONS**

- .1 Review designated substance report and take precautions to protect environment.
- .2 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
  - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative before disrupting building access or services.

**Part 2 Products**

**2.1 EQUIPMENT**

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.
- .2 Demonstrate that tools and machinery are being used in manner which allows for salvage of materials in best condition possible.

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Protection:
  - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
  - .2 Keep noise, dust, and inconvenience to occupants to minimum.
  - .3 Protect building systems, services and equipment.
  - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .3 Disconnect and re-route electrical, telephone and communication service lines. Post warning signs on electrical lines and equipment which must remain energized to serve other products during period of demolition.
- .4 Locate and protect utility lines. Do not disrupt active or energized utilities traversing premises.

**3.2 DEMOLITION SALVAGE AND DISPOSAL**

- .1 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for reuse and recycling.
- .2 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .3 Remove items to be reused, store as directed by Departmental Representative, and re-install under appropriate section of specification.
- .4 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.
- .5 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

**3.3 PARTIAL DEMOLITION OF STRUCTURES**

- .1 Partial demolition, rehabilitation, and preservation work to be in accordance with the Standards and Guidelines for the Conservation of Historic Places in Canada.
- .2 Partial demolition of the structure is intended to allow for condition inspection of components of the building, to determine appropriate method of repair or replacement, where required, and allow access to execute the repair or replacement.

- .3 Prior to removal or demolition, elements must be documented for future reference. This is to include photographs, measurement of geometry and location, and retention of samples with sufficient detail that the original element can be replicated. Remove elements in such a way to allow the original to be reinstated or re-used, where possible.
- .4 Do not proceed with demolition, repair, or replacement work without prior written authorization from Departmental Representative.

### **3.4 STOCKPILING**

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.

### **3.5 REMOVAL FROM SITE**

- .1 Dispose of materials not designated for alternate disposal in accordance with applicable regulations. Disposal facilities must be approved of. Do not deviate from disposal facilities without prior written authorization from Departmental Representative.

### **3.6 CLEANING AND RESTORATION**

- .1 Keep site clean and organized throughout demolition procedure.
- .2 Upon completion of project, reinstate areas affected by Work to condition which existed prior to beginning of Work.

**END OF SECTION**



**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 74 Historic – Long-Term Treatment of Wood.
- .2 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.
- .3 Section 06 10 00 Rough Carpentry.

**1.2 REFERENCES**

- .1 ASTM International Inc.
  - .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
  - .2 ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
  - .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .4 ASTM A325-07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .5 ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength[Metric].
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
  - .1 Handbook of the Canadian Institute of Steel Construction.
  - .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.
- .4 Canadian Standards Association (CSA International)
  - .1 CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
  - .4 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.
  - .5 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.
  - .6 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
  - .7 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
  - .8 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .5 Master Painters Institute

- .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.
- .6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
  - .1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Provide drawings showing assemblies, components, and connections.
- .3 Erection drawings:
  - .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
    - .1 Description of methods.
    - .2 Sequence of erection.
    - .3 Type of equipment used in erection.
    - .4 Temporary bracings.
- .4 Source Quality Control Submittals:
  - .1 Upon request, submit 4 copies of mill test reports 4 weeks prior to fabrication of structural steel.
    - .1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.
    - .2 Provide mill test reports certified by metallurgists qualified to practice in Province of British Columbia, Canada.
- .5 Fabricator Reports:
  - .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.
- .3 Packaging Waste Management: remove for reuse or recycle of pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2            Products**

### **2.1                MATERIALS**

- .1     Structural steel: to CSA-G40.20/G40.21 Grade as indicated on drawings.
- .2     Anchor bolts: to ASTM A307.
- .3     High strength anchor bolts: to ASTM A193/A193M, Grade B7.
- .4     Bolts, nuts and washers: to ASTM A307 or ASTM A325 as indicated on drawings.
- .5     Welding materials: to CSA W48 Series and CSA W59 and certified by Canadian Welding Bureau.
- .6     Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd, red oxide.
- .7     Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m<sup>2</sup>.
- .8     Metals in contact with wood preservatives to be galvanized to CAN/CSA-G164.
- .9     Bolts and lag screws in contact with wood preservatives to be galvanized to ASTM A153.

### **2.2                FABRICATION**

- .1     Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.
- .2     Continuously seal members by continuous welds. Grind smooth.
- .3     Provide holes in top flanges for attachment of wood nailers.

### **2.3                SHOP PAINTING**

- .1     Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.
- .2     Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.
- .3     Apply one coat of primer in shop to steel surfaces to CISC/CPMA 2-75, except:
  - .1     Surfaces and edges to be field welded.
- .4     Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.
- .5     Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.
- .6     Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

**Part 3 Execution**

**3.1 APPLICATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 GENERAL**

- .1 Structural steel work: in accordance with CAN/CSA-S16.
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

**3.3 CONNECTION TO EXISTING WORK**

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

**3.4 MARKING**

- .1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark for fit and match.

**3.5 ERECTION**

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.
- .2 Field cutting or altering structural members: to approval of Departmental Representative.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

**3.6 FIELD QUALITY CONTROL**

- .1 Inspection and testing of materials and workmanship will not be carried out under this Section.
- .2 Provide safe access and working areas for field review of materials and workmanship on site, as required by Departmental Representative.

**3.7 FIELD PAINTING**

- .1 Paint in accordance with Section 09 91 13 - Exterior Painting.
  - .1 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

**3.8 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 06 03 74 Historic – Long-Term Treatment of Wood.
- .2    Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.
- .3    Section 05 12 23 Structural Steel for Buildings.

**1.2                ALTERNATES**

- .1    Obtain Departmental Representative's approval before changing manufacturer's brands, sources of supply, wood species, or wood grade.

**1.3                REFERENCES**

- .1    ASTM International
  - .1    ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated 830 Mpa Minimal Tensile Strength [Metric].
- .2    Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers' Association (CPMA)
  - .1    CISC/CPMA Standard 2-75, Quick Drying Primer for Use on Structural Steel.
- .3    CSA International
  - .1    CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2    CSA O86 Consolidation-09, Engineering Design in Wood.
  - .3    CSA O121-08, Douglas Fir Plywood.
  - .4    CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding).
  - .5    CAN/CSA-Z809-08, Sustainable Forest Management.
- .4    Green Seal Environmental Standards (GS)
  - .1    GS-36-11, Commercial Adhesives.
- .5    National Lumber Grading Authority (NLGA)
  - .1    NLGA Standard Grading Rules for Canadian Lumber 2007.

**1.4                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 adhesives and include product characteristics, performance criteria, physical size, finish and limitations.

## **1.5 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Contractor undertaking work in this section is required to be adequately skilled and trained craftspersons.

## **1.6 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 Storage area designated by Departmental Representative.
  - .2 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .3 Store and protect wood from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.
- .4 Stack wood above ground or soil with spacer slats between layers to ensure adequate ventilation for air drying.
- .5 Cover wood supply with polyethylene sheet.
- .6 Packaging Waste Management: remove for reuse and recycle pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.7 AMBIENT CONDITIONS**

- .1 Adhesive repair:
  - .1 Maintain temperature of elements to be repaired at temperature range throughout its thickness during and after repairs in accordance with manufacturer's specifications.
  - .2 Provide temporary enclosure and heating equipment necessary to maintain temperatures specified.
  - .3 Undertake work under conditions of relative humidity at same level as operational requirements of end product.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Heavy Timber framing:
  - .1 Use Douglas Fir.
  - .2 Grade: No. 1.
  - .3 Actual size: As indicated on drawings, rough cut.

- .4 Moisture content: air dry to 14% Maximum.
- .5 Wedges: Douglas Fir.
- .2 Dimension lumber:
  - .1 Use Douglas Fir.
  - .2 Grade: No. 1/No. 2.
  - .3 Actual size: As indicated on drawing, S45.
  - .4 Moisture content: air dry to 14% Maximum.
- .3 Metal framing connections:
  - .1 Steel: to CSA G40.20/G40.21, grade 300W.
  - .2 Size: As indicated on drawings.
  - .3 Weld: to CSA W59.
  - .4 Paint: prime to CISC/CPMA 2-75.
- .4 Timber connections:
  - .1 Bolts: to ASTM A307.
  - .2 Lag screws: to CSA Standard B34.
- .5 Adhesives:
  - .1 VOC limit 250 g/L 5% by weight maximum to GS-36.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable.
  - .1 Visually inspect substrate and inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Stop work and report immediately to Departmental Representative conditions relevant to this contract not described in drawings: evidence of deficiencies, fungal or insect attack which may affect the scope of work or durability of the finished product.

#### **3.2 PREPARATION**

- .1 Protection of in-place conditions:
  - .1 Protect existing finishes, surfaces and timber elements adjacent to repair area from damage during the Work.
- .2 Surface Preparation:
  - .1 Install adequate scaffolding, ladders and platforms for completion of work.
  - .2 Install adequate shoring and/or bracing. Ensure support in vicinity of repair.
    - .1 Review with Departmental Representative before start of Work.



### 3.3 CONSTRUCTION

- .1 Cut back damaged or decayed wood to a point 25 mm beyond the last evidence of decay.
- .2 Remove decayed wood with extreme care. Cause neither disruption nor damage to adjacent surfaces.
- .3 Create a cavity in as indicated to receive wood laminates.
- .4 Remove decayed wood from building site daily.
- .5 Joints:
  - .1 Lay out and cut joints as indicated.
  - .2 Trial fit joints before fastening in place. Adjust as necessary to ensure close accurate fit with adjacent surfaces.
  - .3 Holes:
    - .1 Largest outer diameter: slightly larger than bored located hole.
  - .4 Bore location holes 5 mm offset.
- .6 Metal Connectors:
  - .1 Recess bolt heads and lag screws, 5 mm below the surface.
  - .2 Tighten bolts sufficient to bring faces of members into contact.
  - .3 Paint metal connector colour: black.
  - .4 Trial fit joint and metal framing connections before fastening in place. Adjust as necessary to ensure close accurate fit.
- .7 Lamination:
  - .1 Set wood laminates in bed of adhesive in accordance with manufacturer's specification.
  - .2 Apply adhesive evenly to both surfaces and clamp to specified pressure.
  - .3 Avoid adhesive drippings. Remove drips and splashes immediately.
  - .4 Remove hard cured adhesive evident in completed work.

### 3.4 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.
  - .2 On completion of work turn over surplus material supplied by Owner to Departmental Representative.

**3.5 PROTECTION**

- .1 Cover completed work not enclosed or sheltered with waterproof covering. Anchor securely in place.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 74 Historic – Long-Term Treatment of Wood.
- .2 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.

**1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .2 CSA International
  - .1 CAN/CSA-O80 Series-08, Wood Preservation.

**1.3 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 storage and protection of wood and include product characteristics, performance criteria, physical size, finish and limitations.

**1.4 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and recycling pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**Part 2 Products**

**2.1 MATERIALS**

- .1 Use alkaline copper quaternary (ACQ) wood preservative.

- .2 Alkaline Copper Quarternary: to CAN/CSA-O80.
- .3 Polyethylene sheet: to CAN/CGSB-51.34, Type 1, 0.15 mm thick.
- .4 Paraffin wax: pure, white, odourless and tasteless in liquid, slab or granulated form.
- .5 Burlap.
- .6 Wood blocks 200 x 200 mm.
- .7 Wood battens 25 x 20 mm.
- .8 Dimension lumber.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable.
  - .1 Visually inspect substrate and inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Inspect wood for evidence of fungi, mould, decay, damage or insect attack.
- .3 Accept wood free from evidence of fungi, mould, decay, damage or insect attack.
- .4 Stop work and report to Departmental Representative immediately evidence of deficiencies or insect and fungal attack which will affect scope of the Work, life safety, and/or durability of finished product.

#### **3.2 PREPARATION**

- .1 Site preparation.
  - .1 Ensure drainage of ground at place of storage.
- .2 Wood preservative treatment:
  - .1 Perform wood preservative treatment in accordance with Section 06 03 74 - Historic - Long-Term Treatment of Wood and Section 06 03 76 - Historic - Antiseptic Treatment of Wood.
- .3 Wax Treatment:
  - .1 Prepare paraffin wax according to manufacturer's written instructions.
  - .2 Apply paraffin wax to end grain of wood.

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

- .1 Protect wood elements, finished surfaces, and material adjacent to area of work from damage during duration of the Work.

### **3.4 CONSTRUCTION AND STORAGE**

- .1 Storage criteria:
  - .1 Prevent direct contact with ground.
  - .2 Stack wood on levelled wood blocks above ground to allow for air circulation.
    - .1 Stack wood in layers separated by stickers/battens placed at end of stack and spaced 900 mm apart along the length of the wood.
  - .3 Cover with polyethylene sheet.
  - .4 Screen wood exposed to wood destroying insects or marine borers.
  - .5 Cover treated logs with polyethylene and maintain free air circulation.
  - .6 Maintain free air circulation by natural means for wood stored in container or other structure, attain specified moisture content.
- .2 Air-dry stored wood: achieve 14% Maximum Moisture Content.
- .3 Prevent shape distortion during air-drying process.
- .4 Protect wood from theft and vandalism.

### **3.5 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.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 15 Historic – Splicing of Wood Components.
- .2 Section 06 03 16 Historic – Storage and Protection of Wood.
- .3 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.

**1.2 REFERENCES**

- .1 American Wood-Preservers Association (AWPA)
  - .1 AWP.A.M2-11, Standard for Inspection of Treated Wood Products.
- .2 CSA International
  - .1 CAN/CSA-O80 Series-08, Wood Preservation.
- .3 Department of Justice Canada
  - .1 Canadian Environmental Assessment Act (S.C. 1992, c37).
  - .2 Pest Control Products Act (S.C. 2002, c28).
- .4 Environment Canada (EC)
  - .1 Canadian Environmental Protection Act (CEPA), 1999.

**1.3 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 and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit purchase orders, invoices and related documents.
  - .3 Submit copies of WHMIS MSDS for all products in accordance with Section 01 35 29.06 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures.
- .3 Certificates:
  - .1 Obtain and submit written approval of Departmental Representative, before start of wood treatment.
  - .2 Submit certificates for following information, certified by authorized signing officer of treatment plant.
    - .1 Information listed in AWP.A M2 applicable to specified treatment.
    - .2 Moisture content after drying following treatment with water-borne preservative.
    - .3 List of acceptable types of paint, stain, and clear finishes that can be used over treated materials to be finished after treatment.

- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2 Low-Emitting Materials:
      - .1 Submit listing of paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

## **1.4 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Adhere to Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
  - .2 Adhere to Canadian Environmental Assessment Act and Review Process as required.

## **1.5 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 in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
  - .4 Store and handle wood preservatives in accordance with provincial work and safety regulations.
- .4 Develop Construction Waste Management Plan related to Work of this section.
  - .1 Do not burn waste at project site.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in the Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Preservative: to CAN/CSA-O80, using CCA preservative to obtain minimum net retention of 4.0 kg/m<sup>3</sup> of wood.

- .2 Solvent: CAN/CSA-O80.
- .3 Use chemical products that have low VOC's.
  - .1 Coatings: VOC limit 250 g/L maximum to SCAQMD Rule 1113.

## **2.2 ACCESSORIES**

- .1 Compressed-air sprayer: with adjustable nozzle to allow spot application and a 1.5 m radius spray.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable.
  - .1 Visually inspect substrate in presence Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed by Departmental Representative.
- .2 Report to Departmental Representative conditions of damp wood found during execution of contract.
- .3 Stop work in that area and report Departmental Representative immediately evidence of deficiencies or insect and fungal attack not described on drawings which will affect scope of the work, life safety and durability of the finished product.
- .4 Obtain approval to proceed with wood treatment from Departmental Representative.

### **3.2 PREPARATION**

- .1 Protection of in-place conditions:
  - .1 Protect adjacent surfaces from contact with preservative during application and for three days afterward.
  - .2 Conduct treatment in designated area approved by Departmental Representative.
- .2 Surface Preparation:
  - .1 Put into effect dust protection and waste removal procedures.
  - .2 Clean dust, dirt and debris from surfaces and cavities of wood to be treated.
  - .3 Dry material to maximum moisture content of 18 %, following water-borne preservative treatment.
  - .4 Cut and drill new wood members to fit intended location, allow for dimensional changes due to treatment.
  - .5 Drill holes in accordance with approved methods by Departmental Representative.



### **3.3 APPLICATION**

- .1 Worker protection:
  - .1 Wear personal protective equipment while working with treated materials in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Use only wood preservative approved under the Pest Control Products Act and Canadian Environmental Assessment Act.
  - .3 Spray or brush application:
    - .1 Apply preservative mixture by brush.
    - .2 Apply preservative to wood surfaces identified by Departmental Representative.
    - .3 Apply 2 flood coats allowing 1 hour drying time between coats.
    - .4 Apply preservative to exposed end grain of wood.

### **3.4 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.
  - .2 Do not burn scrap materials on site.
  - .3 Dispose of waste legally off-site, in accordance with governing regulations.
  - .4 Dispose of end-cuts and left over chemicals in an approved disposal site or facility.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 15 Historic – Splicing of Wood Components.
- .2 Section 06 03 16 Historic – Storage and Protection of Wood.
- .3 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.

**1.2 REFERENCES**

- .1 Department of Justice Canada
  - .1 Canadian Environmental Assessment Act (S.C. 1992, c37).
  - .2 Pest Control Products Act (S.C. 2002, c28).
- .2 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1113-A2011, Architectural Coatings.

**1.3 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 antiseptic treatment of wood and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit purchase orders, invoices and related documents.
  - .3 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Sustainable Design Submittals:
  - .1 Low-Emitting Materials:
    - .1 Submit listing of paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

**1.4 QUALITY ASSURANCE**

- .1 Regulatory Requirements:
  - .1 Adhere to Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments.
  - .2 Adhere to Canadian Environmental Assessment Act.
  - .3 Follow directives of Parks Canada's Management Directive 2.4.1 for the application of pesticides.
  - .4 Follow directives of Parks Canada's Management Directive 2.4.2 for the application of wood preservatives.

- .5 Follow directives of Canada Mortgage and Housing Corporation's Toxic Mould Cleanup Procedures for fungal attack.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood preservatives from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
  - .4 Store and handle wood preservatives in accordance with provincial work and safety regulations.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Use only wood preservatives approved under the Canadian Environmental Assessment Act.
- .2 Coatings: VOC limit 250 g/L maximum to SCAQMD Rule 1113.
- .3 Antiseptic solutions:
  - .1 Copper Naphthenate in accordance with CSA O80.3.
  - .2 Boron rods inserted into pre-drilled holes.
  - .3 Plugs: Threaded plastic.
- .4 Produce mixes in accordance with manufacturer's written instructions.

## **Part 3 Execution**

### **3.1 SITE VERIFICATION OF CONDITIONS**

- .1 Report immediately to Departmental Representative problems related to safe execution of work and unsatisfactory conditions before beginning work.
- .2 Report to Departmental Representative conditions of damp wood found during execution of contract.

- .3 Stop work in that area and report to Departmental Representative immediately evidence of deficiencies or insect and fungal attack which may affect the scope of the Work of the finished product.

### **3.2 PREPARATION**

- .1 Protection of in-place conditions:
  - .1 Protect painted surfaces from contact with preservative during application and for 3 days afterward.
  - .2 Provide a tough plastic tray 1/2 filled with specified preservative in which workers leaving Work area can rinse their rubber boots to prevent spread of decay fungi to other parts of building.
  - .3 Conduct treatment in designated area approved by Departmental Representative.

### **3.3 APPLICATION**

- .1 Follow manufacturer's application requirements. Ensure safety of application.
- .2 Liquid treatments:
  - .1 Apply mixture by brush.
  - .2 Apply 2 coats of mixture to exposed wood surfaces allowing one hour drying time between coats.
- .3 Dry treatments:
  - .1 Apply Borax-based paste and wrap with treated paper as directed by Departmental Representative.
  - .2 Drill holes of required diameter and 6 mm longer than rods plus plugs, insert rods, seal holes in place with plugs.

### **3.4 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 or 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 Dispose of waste legally off-site, at a designated disposal site or facility in accordance with governing regulations.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 06 03 74 Historic – Long-Term Treatment of Wood.
- .2 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.

**1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealloyed) by the Hot-Dip Process.
  - .3 ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
  - .4 ASTM D5456-11, Standard Specification for Evaluation of Structural Composite Lumber Products.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-11.3-M87, Hardboard.
  - .2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .3 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction and amendment.
  - .4 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- .3 CSA International
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2 CSA O112.9-10, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
  - .3 CSA O121-08, Douglas Fir Plywood.
  - .4 CAN/CSA O122-06(R2011), Structural Glued-Laminated Timber.
  - .5 CSA O141-05(R2009), Softwood Lumber.
  - .6 CSA O325-07, Construction Sheathing.
- .4 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2010.

**1.3 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 wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.

#### **1.4 QUALITY ASSURANCE**

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, in accordance with CSA and ANSI standards.

#### **1.5 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 and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and recycling pallets, crates, padding, and packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **Part 2 Products**

#### **2.1 FRAMING STRUCTURAL AND PANEL MATERIALS**

- .1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Glued end-jointed (finger-jointed) lumber is not permitted.
- .3 Structural Composite Lumber (SCL) in accordance with ASTM D5456.
- .4 Framing and board lumber: in accordance with NBC, except as follows:
  - .1 Diagonal Sheathing: Douglas Fir species: NLGA "Standard" or better grade.
  - .2 Dimensional Lumber: Douglas Fir species: NLGA Grade No. 1/ No. 2 or better.
  - .3 Heavy Timber: Douglas Fir species: NLGA Grade No. 1 or better.
- .5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  - .1 Board sizes: "Standard" or better grade.
  - .2 Dimension sizes: "Standard" light framing or better grade.
- .6 Plywood: to CSA O325.
- .7 Douglas fir plywood (DFP): to CSA O121, standard construction.

## **2.2 ACCESSORIES**

- .1 Subflooring adhesive: to CAN/CGSB-71.26, cartridge loaded.
  - .1 Adhesives: VOC limit 120 g/L maximum to GS-36.
- .2 General purpose adhesive: to CSA O112.9.
  - .1 VOC limit 200 g/L maximum to GS-36.
- .3 Nails, spikes and staples: to CSA B111.
- .4 Bolts: 16 mm diameter unless indicated otherwise, complete with nuts and washers.
- .5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
- .6 Fastener Finishes:
  - .1 Galvanizing: to ASTM A653, use galvanized fasteners for locations indicated on drawings.
  - .2 Stainless steel: use stainless steel 316 alloy for locations indicated on drawings.
- .7 Wood Preservative:
  - .1 Preservative: in accordance with manufacturer's recommendations for surface conditions.

## **Part 3 Execution**

### **3.1 EXAMINATION**

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

### **3.2 PREPARATION**

- .1 Treat surfaces of material with wood preservative, before installation.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
- .4 Treat material as follows:
  - .1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.

### **3.3 MATERIAL USAGE**

- .1 Lantern room floor sheathing:
  - .1 Plywood, DFP sheathing grade, T and G edge, 16 mm thick.

- .2 Exterior wall sheathing:
  - .1 Plywood, DFP sheathing grade, square edge, 16 mm thick.

### **3.4 INSTALLATION**

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with "crown-edge" up.
- .4 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install subflooring with panel end-joints located on solid bearing, staggered at least 800 mm.
  - .1 In addition to mechanical fasteners, floor panels secure floor subflooring to floor joists using glue and screws. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.
- .6 Install furring and blocking as required to space-out and support fascia, soffit, siding, and other work as required.
- .7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .8 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .9 Install sleepers as indicated.
- .10 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .11 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .12 Countersink bolts where necessary to provide clearance for other work.
- .13 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

### **3.5 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 rough carpentry installation.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 02 41 16.01 Structure Demolition – Short Form.
- .2 Section 06 03 15 Historic – Splicing of Wood Components.
- .3 Section 06 03 16 Historic – Storage and Protection of Wood.
- .4 Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.
- .5 Section 09 91 13 Exterior Painting.

**1.2 REFERENCES**

- .1 Definitions:
  - .1 Shingle: tapered slice of wood sawn from block with taper in direction of grain or axial direction.
  - .2 Shake: split shingle of 9.5 mm thickness with or without taper occurring in direction of grain or axial direction.
- .2 Reference Standards:
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
  - .2 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .4 CSA International
  - .1 CSA A123.3-05(R2010), Asphalt Saturated Organic Roofing Felt.
  - .2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .3 CSA O118.1-08, Western Red Cedar Shakes and Shingles.
  - .4 CAN/CSA-Z809-08, Sustainable Forest Management.
- .5 Cedar Shake and Shingle Bureau (CSSB)
  - .1 CSSB-97, Cedar Shake and Shingle Grading Rules.
  - .2 CSSB New Roof Construction Manual for Roof Application Details 2011.
  - .3 CSSB Exterior and Interior Wall Manual for Sidewall Application Details 2002.
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .7 Sustainable Forestry Initiative (SFI)
  - .1 SFI-2010-2014 Standard.

**1.3 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 wood shingles and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Include information on preservation and restoration of shingles.
- .3 Samples:
  - .1 Submit duplicate full size shingles, of finish and profile specified.

#### **1.4 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Installer: company or person specializing in shingle and shake work installations approved by manufacturer with 5 years documented experience.
- .2 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Construct 1200 mm x 1200 mm mock-up where directed by Departmental Representative.
    - .2 For testing to determine compliance with performance requirements.
      - .1 Perform tests as follows:
    - .3 Allow 24 hours for inspection of mock-up before proceeding with work.
    - .4 When accepted, mock-up will demonstrate minimum standard of quality required for this work.
      - .1 Approved mock-up may remain as part of finished work
- .3 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, 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 Exercise care to avoid damage during unloading and storing.
  - .2 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .3 Store and protect shingles from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.
  - .5 Remove only in quantities required for same day use.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.6 UNUSED MATERIALS**

- .1 Unused shingles remain property of Owner.
- .2 Return unused shingles to Owner. Retain packaging or rewrap shingles to form complete bundles.
- .3 Label packages to identify product, quantity and manufacturer/supplier.
- .4 Deliver and store in location designated by Departmental Representative.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Red cedar shingles: to CSA O118.1, 450 mm length, 120 mm width, square pattern, No. 1 Blue Label A Extra. Factory Painted with exterior alkyd primer primer and 1 coat exterior satin latex
  - .1 CAN/CSA-Z809 or FSC or SFI certified.
- .2 Roofing felt: to CSA A123.3, perforated asphalt felt; No.15 unless otherwise specified.
- .3 Sheathing paper: to CAN/CGSB-51.32, perforated.
- .4 Polyethylene sheet: to CAN/CGSB-51.34, 0.154 mm thick.
- .5 Nails: to be Stainless steel Type 316 to CSA O118.1, Appendix C.
- .6 Strapping to be pressure treated 12 mm x 50 mm plywood.
- .7 Metal Flashings to be 0.33 mm thick pre-painted galvanized steel.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable 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.

### **3.2 MANUFACTURER'S INSTRUCTIONS**

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

### **3.3 REMOVAL OF EXISTING SHINGLE**

- .1 Remove existing shingles, flashings and underlay, and expose sheathing or shingle lath of roof.

- .2 Withdraw existing shingle and flashing nails, set those which break off. Leave surfaces free from dirt and loose material.
- .3 Departmental Representative to inspect roof sheathing. Remove all exterior sheathing boards and store for re-use. Discard those boards affected by fungal or insect attack as directed on site by Departmental Representative.
- .4 Replace cut out portions of sheathing boards or lath with boards of equal sectional dimensions, and specified grade. Seat each end of board on framing member, with 25 mm bearing, and secure to rafter.

### **3.4 APPLICATION**

- .1 Do wood shingle work in accordance with BCBC Part 9 and CSA O118.1, Appendix B, except where indicated otherwise.
- .2 Install shingles over dry substrate open strapping.
- .3 Space shingles from 6 to 10 mm.
- .4 Stagger joints minimum of 40 mm in succeeding courses. Ensure that in any 3 courses no two joints are in alignment.
- .5 Use two nails per shingle. Space nails 20 mm from edge and 40 mm above butt line of following course.
- .6 Drive nails flush but do not crush shingles.

### **3.5 SHINGLE AND SHAKE ROOFING**

- .1 Eave protection:
  - .1 Install 2-ply Type No.15 roofing felt system.
  - .2 Underlayment:
    - .1 Install over sheathing, 2 layers 60 minute sheathing paper and PT plywood strapping.
    - .2 Install 450 mm wide strip of No.15 asphalt-saturated felt underlayment over wood shakes after applying each course.
    - .3 Install metal flashings with insect screen as shown in the drawings
- .2 Install shingles with 115 mm weather exposure and having triple thickness of shingle at any given point.
- .3 Double shingles at eaves, projecting butts 40 mm from bottom strapping. Project shingles 19 mm minimum at gable ends.
- .4 Lay shingles with grain perpendicular to eaves.
- .5 Saw shingles parallel to valley centre line. Do not break joints into valley.
- .6 Apply strip of sheathing paper minimum 200 mm wide over hips and ridges. Use shingles of uniform width approximately 150 mm wide. Apply shingles at same weather exposure as field of roof.
- .7 Install metal flashings at all hips, ridges and corners.
- .8 Install bottom step flashing (soaker base flashing) interleaved between shingles at vertical junctions.

### **3.6 WALL SIDING SHINGLES AND SHAKES**

- .1 Underlayment:
  - .1 Install over sheathing, 2 layers of sheathing paper and PT plywood strapping.
  - .2 Install horizontally and fasten to strapping with SS 316 nails. Lap edges 75 mm.
- .2 Install shingles with 115 mm exposure using single course method to ensure triple thickness at any given point. At external corners alternate overlap.

### **3.7 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.

### **3.8 PROTECTION**

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

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1     Section 06 03 15 Historic – Splicing of Wood Components.
- .2     Section 06 03 16 Historic – Storage and Protection of Wood.
- .3     Section 06 03 76 Historic Structures – Antiseptic Treatment for Wood.
- .4     Section 07 31 29 Wood Shingles and Shakes.

**1.2                REFERENCES**

- .1     Environmental Protection Agency (EPA)
  - .1        Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2     Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .3     The Master Painters Institute (MPI)
  - .1        Architectural Painting Specification Manual - February 2004.
  - .2        Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
- .4     National Fire Code of Canada.
- .5     Society for Protective Coatings (SSPC)
  - .1        Systems and Specifications, SSPC Painting Manual 2005.

**1.3                QUALITY ASSURANCE**

- .1     Qualifications:
  - .1        Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2        Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
  - .3        Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
  - .4        Conform to latest MPI requirements for exterior painting work including preparation and priming.
  - .5        Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
  - .6        Paint materials such as linseed oil, shellac, and turpentine to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
  - .7        Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

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

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Environmental Performance Requirements:
  - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
  - .2 Green Performance in accordance with MPI Standard GPS-1.

#### **1.5 SCHEDULING**

- .1 Submit work schedule for various stages of painting to Departmental Representative for approval. Submit schedule minimum of 48 hours 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.

#### **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Upon completion, submit records of products used. List products in relation to finish system and include the following:
  - .1 Product name, type and use.
  - .2 Manufacturer's product number.
  - .3 Colour number[s].
  - .4 MPI Environmentally Friendly classification system rating.
  - .5 Manufacturer's Material Safety Data Sheets (MSDS).
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.



- .2 13 mm birch plywood for finishes over wood surfaces.
- .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
- .4 10 mm cedar for finishes over wood surfaces.
- .2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
- .3 Submit full range of available colours where colour availability is restricted.

## **1.7 QUALITY CONTROL**

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 When requested by Departmental Representative or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

## **1.8 MAINTENANCE**

- .1 Extra Materials:
  - .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit one, four litre can of each type and colour of primer. Identify colour and paint type in relation to established colour schedule and finish system.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  - .1 Deliver and store materials in original containers, sealed, with labels intact.
  - .2 Labels: to indicate:
    - .1 Manufacturer's name and address.
    - .2 Type of paint or coating.
    - .3 Compliance with applicable standard.
    - .4 Colour number in accordance with established colour schedule.
  - .3 Remove damaged, opened and rejected materials from site.
  - .4 Provide and maintain dry, temperature controlled, secure storage.
  - .5 Observe manufacturer's recommendations for storage and handling.
  - .6 Store materials and supplies away from heat generating devices.
  - .7 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
  - .8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

- .9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
- .10 Remove paint materials from storage only in quantities required for same day use.
- .11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .12 Fire Safety Requirements:
  - .1 Provide one 9 kg Type B Carbon dioxide (CO<sub>2</sub>); halon2 ; dry chemical; aqueous film forming foam (AFFF) 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 flammable and combustible materials in accordance with the National Fire Code of Canada.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for recycling 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 reused 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 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
    - .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 organizations for verifiable re-use or re-manufacturing.
- .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

## **1.10 AMBIENT CONDITIONS**

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces in accordance with this Section.
  - .2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place 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 Where required, provide continuous ventilation for seven 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 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and applied 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's prescribed limits.
    - .4 Relative humidity is above 85 % or when dew point is less than 3 degrees C variance between air/surface temperature.
    - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
  - .2 Perform no painting work when maximum moisture content of substrate exceeds:
    - .1 12 % for concrete and masonry (clay and concrete brick/block).
    - .2 15 % for wood.
  - .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
  - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:

- .1 Apply paint finish 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 to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
  - .1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.
  - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
  - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems: to be products of single manufacturer.
- .3 Only qualified products with E2"Environmentally Friendly" rating or better are acceptable for use on this project.
- .4 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

- .6 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.
- .7 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
  - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E 2 rating.
- .9 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.
- .10 Recycled water-borne surface coatings must not contain:
  - .1 Lead in excess of 600.0 ppm weight/weight total solids.
  - .2 Mercury in excess of 50.0 ppm weight/weight total product.
  - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
  - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
  - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

## **2.2 COLOURS**

- .1 Submit proposed Colour Schedule to Department Representative for approval.
- .2 Colour schedule will be based upon selection of three base colours:
  - .1 Grey for balcony deck and lamphouse floor.
  - .2 White for Tower exterior and lamphouse base interior.
  - .3 Red for concrete base.
  - .4 Red for Railings and lamphouse base exterior.

No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .3 Selection of colours will be from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## **2.3 MIXING AND TINTING**

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Department Representative written permission.

- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Department Representative.
- .5 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.

**2.4 GLOSS/SHEEN RATINGS**

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 - matte finish	0 to 5	max. 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	min. 35
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.

**2.5 EXTERIOR PAINTING SYSTEMS**

- .1 Concrete Vertical Surfaces: (including horizontal soffits)
  - .1 EXT 3.1A - Latex semi-gloss finish.
- .2 Structural Steel and Metal Fabrications:
  - .1 EXT 5.1H - Pigmented polyurethane finish (over epoxy).
- .3 Galvanized Metal: not chromate passivated
  - .1 EXT 5.1H - Pigmented polyurethane finish (over epoxy).
  - .2 Factory applied baked enamel finish.
- .4 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.
  - .1 EXT 6.2A - Latex semi- gloss finish over alkyd primer.
- .5 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.
  - .1 EXT 6.3L - Latex semi- gloss finish over alkyd stain blocking primer.
- .6 Wood Decks: Plywood
  - .1 Pigmented polyurethane basecoat and top coat with anti-skid grit over primer. Polyurethane to meet requirements of ASTM C957 and be applied at dry mil thicknesses of 0.5 mm (0.020 inches) for both top coat and base coat.
- .7 Wood Shingle and Shake Siding:

- .1 EXT 6.6A - Latex Satin finish over alkyd stain blocking primer. Alkyd stain blocking primer and 1<sup>st</sup> coat of latex to factory applied by dipping. 2<sup>nd</sup> coat latex to be applied in the field.

### **Part 3 Execution**

#### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

#### **3.2 EXAMINATION**

- .1 Exterior surfaces requiring repainting: inspected by Painting Contractor who will notify the Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .2 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .3 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, 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 to Departmental Representative.
- .4 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.
- .5 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .6 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent 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. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.
  - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .7 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .8 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .9 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .10 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.

### **3.3 EXISTING CONDITIONS**

- .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 a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
  - .1 Wood: 15%.

### **3.4 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 such surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .5 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

### **3.5 APPLICATION**

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush and/or roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:



- .1 Apply paint in a uniform layer using brush and/or roller of types 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 shall be free of roller tracking and heavy stipple unless approved by Departmental Representative.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
- .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
  - .4 Brush out immediately runs and sags.
  - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized Departmental Representative.
  - .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
  - .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
  - .7 Sand and dust between coats to remove visible defects.
  - .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
  - .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

### **3.6 MECHANICAL/ELECTRICAL EQUIPMENT**

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates.
- .4 Paint fire protection piping red.

### **3.7 FIELD QUALITY CONTROL**

- .1 Inspection:
  - .1 Field inspection of exterior painting operations to be carried out Departmental Representative.
  - .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.
  - .3 Co-operate with inspection personnel and provide access to areas of work.
- .2 Manufacturer's Field Services:
  - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

### **3.8 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

### **3.9 RESTORATION**

- .1 Clean and re-install hardware items removed before undertaking painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

### **3.10 WARRANTY**

- .1 All painting and coating work will be guaranteed for 5 years from the date of substantial completion with a joint labour and materials guarantee. This guarantee stipulates that the coating work is done according to the applicable standards specified and that any defects in the work due to faulty workmanship or materials supplied in accordance with the specifications which occur within 5 years of the date of completion will be corrected at the contractor's expense.

**END OF SECTION**