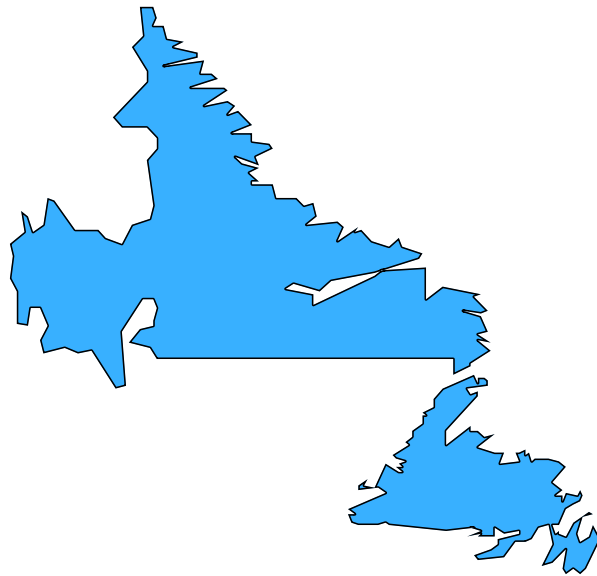


**PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
REAL PROPERTY CONTRACTING
NL DIVISION**

SPECIFICATION

**Standing Offer
Minor Works
Central & Western Newfoundland
& Southern Labrador**

SOLICITATION #: EA011-190880/A



<u>Contracting Officer:</u>
Cheryl O'Brien Real Property Contracting 10 Barter's Hill, P.O. Box 4600 St. John's, NL A1C 5T2 Telephone: (709) 772-3460 Facsimile: (709) 772-4603

Specification Section	Title	Pages
01 10 10	GENERAL INSTRUCTIONS	9
01 29 83	PAYMENT PROCEDURES FOR TESTING LABORATORY SERVICES	2
01 33 00	SUBMITTAL PROCEDURES	4
01 35 24	SPECIAL PROCEDURES ON FIRE SAFETY REQUIREMENTS	5
01 35 29	HEALTH AND SAFETY REQUIREMENTS	10
01 35 43	ENVIRONMENTAL PROCEDURES	4
01 56 00	TEMPORARY BARRIERS AND ENCLOSURES	2
01 74 11	CLEANING	2
01 74 21	CONSTRUCTION/DEMOLITION WASTE MANAGEMENT & DISPOSAL	4
02 41 16	SITWORK, DEMOLITION AND REMOVAL	3
03 10 00	CONCRETE FORMING AND ACCESSORIES	3
03 20 00	CONCRETE REINFORCING	4
03 30 00	CAST-IN-PLACE CONCRETE	10
06 05 73	WOOD TREATMENT	3
07 92 10	JOINT SEALING	5
31 23 10	EXCAVATING, TRENCHING AND BACKFILLING	5
31 23 25	ROCK AND GRAVEL FILL	5
31 53 16	STRUCTURAL TIMBER	10
34 17 39	VEHICLE W-BEAM GUIDE RAIL	3
35 59 29	MOORING DEVICES	3
LIST OF DRAWINGS		1

Title

TYPICAL DRAWINGS

CB-02	Enclosed Ladder – Detail and Fastening
CB-03	Typical Ladder – Detail and Fastening
CB-05	Typical Detail – Vertical/ Horizontal Fenders
CB-06	Typical Plywood Conduit Protection
CB-07A	Cleat Placement – Plan and Section
CB-08	Jib Crane Foundation for Existing Crib Wharf
CB-12	Typical Timber Step Crib
CB-16	Typical Dowel Detail
CB-17	Bean Protection Detail
CB-18	Typical Anchor Bolt Detail
CB-20	Wood Plank Decking Detail
CB-22	Detail – Wheelguard Bolting to Plank Deck
CB-23	Detail - Wheelguard Bolting to Coping
CB-24	Detail – Control Joint for Cribwork
CB-26	Detail – Mooring Ring
CB-27	Detail – Splice in Wale
CB-28	Detail – Exterior Beam Splice
CB-29	Detail – Bolting of Interior Beams
CB-30	Timber Pile Shoe Detail
CB-32	Detail – Light Pole in Cribwork
CB-34	Typical Detail – Closed Face Fenders
CB-38	Detail – Wheelguard Bolting to Concrete Deck
CB-39	Main Haulout Block Detail
CB-42	Pipe Wheelguard in Existing Deck
CB-46	Detail – Fenders and Chocks
CB-47	Detail – Horizontal Fenders
CB-53	Floating Dock Accessories – Anchor Block Detail
CB-54	Floating Dock Accessories – Anchor Block Lifting Bar
CB-60	Typical Horizontal Fender Detail
NL-20	Wheelguard Detail

END

1.1 SCOPE

- .1 The work covered under this Standing Offer contract consists of the furnishing of all plant, labour, equipment and material for Minor Works to in-water marine structures, upland marine structures, road structures, parking areas, buildings and miscellaneous properties located at various Parks Canada sites, Fisheries and Oceans sites and Transport Canada sites in Newfoundland and Labrador, in strict accordance with specifications and accompanying typical drawings and subject to all terms and conditions under this Standing Offer.

1.2 DESCRIPTION OF WORK

- .1 In general, work under this contract consists of, but will not necessarily be limited to, repairs to or replacement of components in various marine, civil and building structures.
 - .1 Demolition, removal and disposal of existing items designated by the Departmental Representative. (i.e. various structural components and associated hardware and remnants.)
 - .2 Demolition and removal of sections of reinforced concrete slabs, concrete blocks. Thicknesses vary from 150 mm to 250 mm. Areas range from 1 m² to 30 m².
 - .3 Demolition and removal of miscellaneous concrete blocks, concrete structures, etc.
 - .4 Supply and installation of structural timber (treated or untreated) for various applications as described and specified.
 - .5 Supply and installation of treated timber cribwork.
 - .6 Supply and installation of treated timber marine structures.
 - .7 Supply and installation of mooring cleats.
 - .8 Supply and installation of mooring rings.
 - .9 Supply and installation of galvanized steel guiderail, treated timber posts and blocking.
 - .10 Supply and installation of materials to clean/repair control and expansion joints in concrete decks.
 - .11 Supply and installation of materials to repair sections of reinforced concrete deck. Thicknesses vary from 200 mm to 250 mm. (areas 1 m² to 30 m²).
 - .12 Supply, placement and compaction of armour stone, rip rap, rock and gravel fill as specified.
 - .13 Painting of timbers, wheelguard, wheelguard blocking, tops of fenders and ladders. Contractor to supply all primer and paint as specified.
 - .14 Supply and installation of miscellaneous minor structures as directed.
 - .15 Supply of miscellaneous material as required.
 - .16 Supply of manpower to carry out miscellaneous labour as required.
 - .17 Rental or supply of heavy construction equipment as required.
 - .18 Rental or supply of tandem dump trucks nor boom trucks as required.
 - .19 Rental or supply of miscellaneous specialized equipment or tools as required.

1.3 SITE OF WORK

- .1 Work may be carried out in various locations on the Island of Newfoundland or in Southern Labrador. The primary locations for Parks Canada work are Gros Morne

National Park and Terra Nova National Park. However work may also be required in Parks Canada Sites in Port au Choix, L'Anse au Meadows and Red Bay NL. The primary locations for marine work are the various Fisheries and Oceans harbours in Western Newfoundland, Central Newfoundland and Southern Labrador. Work may also be necessary in Transport Canada Sites in Parks Canada Sites in Marystown, Charlottetown (Bonavista Bay) and Terrenceville.

1.4 BASE OF OPERATIONS

- .1 Corner Brook, NL will be considered the base of operations for this Standing Offer. Mobilization costs for various types of equipment will be paid by the kilometer to and from home base to the work site.

1.5 DATUM

- .1 Datum used for this standing offer is Lowest Normal Tides (L.N.T.). A benchmark location and elevation will be provided at each location if required.
- .2 Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.

1.6 CODES AND STANDARDS

- .1 Perform work in accordance with:
 - .1 The latest edition of the National Building Code of Canada,
 - .2 The latest edition of the National Fire Code
 - .3 Canada Labour Code
 - .4 Newfoundland and Labrador OHS Act and Regulations
 - .5 Any other code of provincial or local application including all amendments up to project bid closing date
 - .6 In any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.7 DEFINITIONS

- .1 Engineer. The term Engineer, where used in the specifications and on the drawings, shall mean the Departmental Representative as defined in the General Conditions of the Contract.
- .2 Departmental Representative means the PWGSC person designated as administering the Standing Offer Contract.
- .3 Project Manager means the PWGSC person or designate in charge of the project.

- .4 Resident Inspector means the person providing onsite coordination and inspection of the project.

1.8 DEPARTMENTAL RESPONSIBILITY

- .1 Public Works and Government Services Canada will provide project management staff for the various projects as required. In the case of this standing offer, the roles of the Departmental Representative and the Project Manager will be fulfilled by the same PWGSC representative.

1.9 SETTING OUT THE WORK

- .1 Set grades and layout work in detail from work control points and grades.
- .2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.
- .3 Provide devices needed to layout and construct work.
- .4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .5 Supply stakes and other survey markers required for laying out work.

1.10 WORK SCHEDULE

- .1 If required, the contractor may have to mobilize to the call-up site within forty-eight (48) hours of notification from the Departmental Representative. Failure to mobilize as required by the Departmental Representative may result if the call-up being rescinded and awarded to the optional bidder.
- .3 If required by the Departmental Representative, a work schedule is to be prepared and submitted in the form of Bar (GANTT) Chart, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for completion of project.
- .4 The schedule, including all updates, shall be to the Departmental Representatives' approval. Take necessary measures to complete the work within approved time. Do not change schedule without Departmental Representatives' approval.

1.11 ABBREVIATIONS

- .1 Following abbreviations of standard specifications have been used in this specification and on the drawings:
CGSB - Canadian Government Specifications Board

CSA - Canadian Standards Association
NLGA - National Lumber Grades Authority
ASTM - American Society for Testing and Materials

- .2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

1.12 QUARRY AND EXPLOSIVES

- .1 Make own arrangements with Provincial authorities and owners of private properties, for the quarrying and transportation of rock and all materials and machinery necessary for work over their property, roads or streets as case may be.

1.13 MEETINGS

- .1 Departmental Representative will arrange meetings, set times, record and distribute minutes to all parties present at the meetings.
- .2 Meetings will take place on site of work unless so directed by the Departmental Representative.
- .3 Have a responsible member of firm present at all project meetings.

1.14 PROTECTION

- .1 Store all materials & equipment to be incorporated into work to prevent damage.
- .2 Repair or replace all materials or equipment damaged in transit or storage to the satisfaction of Departmental Representative and at no cost to Canada.

1.15 EXISTING SERVICES

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to site operations, pedestrian, vehicular traffic, client operations.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. This includes disconnection of electrical power and communication services to client's operational areas. Adhere to approved schedule and provide notice to affected parties.

- .4 Provide temporary services when directed by Departmental Representative to maintain critical facility systems.
- .5 Provide adequate bridging over trenches which cross walkways or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm in writing.
- .7 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

1.16 DOCUMENTS REQUIRED

- .1 Maintain at job site, if required, one copy each of the following:
 - .1 Drawings, Specifications and Addenda
 - .2 Reviewed Shop Drawings
 - .3 Other modifications to Contract
 - .4 Field Test Reports
 - .5 Copy of Approved Work Schedule
 - .6 Site specific Health and Safety Plan and other safety related documents
 - .7 Other documents as stipulated elsewhere in the Contract Documents.

1.17 PERMITS

- .1 Obtain and pay for all permits, certificates and licenses as required by Municipal, Provincial, Federal and other Authorities.
- .2 Provide appropriate notifications of project to municipal & provincial inspection authorities.
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.
- .4 Submit to Departmental Representative, copy of application submissions and approval documents received for above referenced authorities.
- .5 Submit to Departmental Representative, copy of quarry permit, if applicable, prior to start of quarry operations.
- .6 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.

1.18 CUTTING, FITTING AND PATCHING

- .1 Execute cutting, including excavation, fitting & patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work. This includes patching of openings in existing work resulting from removal of existing services.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit work airtight to pipes, sleeves ducts and conduits.
- .6 Be responsible for obtaining manufacturer's literature and for correct roughing-in and connection of equipment, fixtures and appliances.

1.19 EXISTING SUB-SURFACE CONDITIONS

- .1 Information pertaining to the existing sub-surface conditions may be available by contacting the Departmental Representative.
- .2 Contractors are cautioned that any previous investigations that may be available for review, were intended to provide general site information only. Any interpolation and/or assumptions made relative to any previous investigations is the Contractor's responsibility.

1.20 LOCATION OF EQUIPMENT

- .1 Location of equipment, fixtures, utilities, and wharf appurtenances shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.21 FISH HABITAT

- .1 Where work is being conducted in an area where fish habitat may be affected. Perform work to conform with rules and regulations governing fish habitat and in accordance with authorization for work or undertakings affecting fish habitat.

- .2 Further queries/reporting as per conditions of the Authorization should be directed to DFO – Fisheries Protection Program.

1.22 NOTICE TO SHIPPING/MARINERS

- .1 When work is being performed in a marine environment notify the Canadian Coast Guard Shipping office via their twenty-four (24) hour telephone reporting system (709) 772-2083, at the issuance of the call-up and upon completion of the work.
- .2 During construction any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.

1.23 ACCEPTANCE

- .1 In company with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.

1.24 WORKS COORDINATION

- .1 The Contractor is responsible for coordinating the work of the various trades, if required, where the work of such trades interfaces with each other.
- .2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
- .3 Canada will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor and shall be resolved at no extra cost to Canada.

1.25 CONTRACTOR'S USE OF SITE

- .1 Construction operations, including storage of materials for this Standing Offer, not to interfere with the day to day activities and/or operations at the work site.
- .2 Responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative.
- .3 Take adequate precautions to protect all existing surfaces when operating tracked equipment.

- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 Remove snow and ice as required to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.
- .6 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.

1.26 WORK COMMENCEMENT

- .1 Mobilization to the call-up site is to commence within forty-eight (48) hours of issuance of call-up, unless otherwise agreed by Departmental Representative.
- .2 Submission of Site Specific Safety Plan is required prior to mobilization to site.
- .3 Project work on site is to commence with a continuous reasonable work force, unless otherwise agreed by Departmental Representative.
- .4 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional work force to complete the project within the specified completion time.
- .5 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

1.27 FACILITY SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions where applicable.

1.28 INTERPRETATION OF DOCUMENTS

- .1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual.

1.29 ASBESTOS DISCOVERY

- .1 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of work, stop work and verbally notify Departmental Representative immediately. Immediately follow-up with written notification.
- .2 Do not proceed with relevant work until written instructions have been received from Departmental Representative.

1.30 PAYMENTS / INVOICING

- .1 Contractor is required to notify Departmental Representative upon completion of work at each call-up location before submitting invoice
- .3 In association with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.
- .4 Invoice must show:
 - .1 Standing Offer & Call-up Numbers
 - .2 Work Location
 - .3 Description of Work
 - .4 Quantities broken down as per items in Unit Table.
 - .5 Items identified by Departmental Representative to be supplied under Miscellaneous Material Allowance.
 - .6 Items identified by Departmental Representative to be supplied under Labour.
 - .7 Items identified by Departmental Representative to be supplied or rented under Heavy Equipment Allowance.
 - .8 Items identified by Departmental Representative to be supplied or rented under Truck Allowance.
 - .9 Items identified by Departmental Representative to be supplied or rented under Miscellaneous Equipment Allowance.
- .5 In the event of a dispute the Contractor is to make any and all records available to the Departmental Representative to substantiate invoiced amount.
- .6 When submitting invoices for payment of items, quote pre HST amounts, Where HST has been paid on an item, deduct HST when invoicing for reimbursement.
- .7 The Departmental Representative reserves the right to increase or decrease quantities.

1.31 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

END OF SECTION

PART 1 – GENERAL

1.1 SECTION INCLUDES

- .1 Inspecting and testing by inspecting firms or testing laboratories designated by Departmental Representative.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

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

1.3 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except for the following:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Mill tests and certificates of compliance.
 - .4 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
 - .5 Tests requested by Departmental Representative to confirm material specifications when the applicable manufacturer's documentation or test results are unavailable.
 - .6 Additional tests specified in the following paragraph.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.4 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide adequate labour, equipment and facilities to:
 - .1 Provide access to Work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
- .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials other than concrete cylinders are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

- .5 Concrete Cylinders:
 - .1 Must remain on site for a minimum of twenty (20) hours after casting, prior to moving,
 - .2 Must be stored in a location that is protected from any shocks or exposure to adverse conditions.
 - .3 Must be transported off site between twenty (20) hours to thirty-six (36) hours from cast time.
 - .4 Transportation by laboratory personnel will be arranged by the Departmental Representative in conjunction with the contractor.
 - .5 Transportation by laboratory personnel will be paid for by the Departmental Representative.

1.5 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Shop Drawings
- .2 Product Data
- .3 Mix Designs

1.2 SUBMITTAL GENERAL REQUIREMENTS

- .1 Submit to Departmental Representative for review, if required, submittals listed, including Shop Drawings, Product Data, Samples, Mix Designs, Certificates and other data, as specified in other sections of the Specifications.
- .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work.
- .3 Do not proceed with work until relevant submissions are reviewed and approved by Departmental Representative.
- .4 Present Shop Drawings, Product Data, Samples and Mix Designs in SI Metric units.
- .5 Where items or information is not produced in SI Metric units, provide converted values.
- .6 Review submittals prior to submission to Departmental Representative. Ensure during review that necessary requirements have been determined and verified, required field measurements or data have been taken, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
- .7 Submittals which are not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.
- .8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .9 Verify field measurements and affected adjacent work and coordinate.
- .10 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .11 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.

1.2 SUBMITTAL GENERAL REQUIREMENTS (Cont'd)

- .12 Submittal format: electronic copies, paper originals, or alternatively clear and fully legible photocopies of originals are acceptable. Facsimiles are not acceptable.
- .13 Make changes or revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
- .14 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS, PRODUCT DATA, SAMPLES & MIX DESIGNS

- .1 The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, product data, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Number of Shop Drawings: Submit one (1) copy of shop drawings
- .3 Shop Drawings Content and Format:
 - .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.
 - .2 Shop Drawings Format:
 - .1 Electronic copies, opaque white original prints or clear and fully legible photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.
 - .2 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data.
 - .3 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
 - .4 Delete information not applicable to project on all submittals.
- .4 Allow three (3) calendar days for Departmental Representative's review of each submission.
- .5 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.

1.3 SHOP DRAWINGS, PRODUCT DATA, SAMPLES & MIX DESIGNS (Cont'd)

- .6 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.
7. Accompany each submission with transmittal letter containing:
 - .1 Date.
 - .2 Project title and project number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data & sample.
 - .5 Other pertinent data.
- .8 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and project 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 Cross references to particular details of contract drawings, if applicable, and specifications section number for which shop drawing submission addresses.
 - .6 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout showing dimensions, include identified field dimensions & clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 The review of shop drawings by the Departmental Representative or their delegated representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Public Works and Government Services Canada approves the detail design inherent in the 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 all requirements of the construction and Contract Documents.

1.3 SHOP DRAWINGS, SAMPLES, PRODUCT DATA & MIX DESIGNS (Cont'd)

- .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 all sub-trades.

1.4 SCHEDULES, PERMITS AND CERTIFICATES

- .1 Upon acceptance of Call-up, submit to Departmental Representative copy of Work Schedule and various other schedules, permits, certification documents and project management plans as specified in other sections of the Specifications.
- .2 Submit copy of permits, notices, compliance Certificates received by regulatory Agencies having jurisdiction and as applicable to the Work.
- .3 Submission of above documents to be in accordance with Submittal General Requirements procedures specified in this section.

1.5 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Fire Safety Requirements.
- .2 Hot Work Permit.

1.2 RELATED WORK

- .1 Section 01 35 29 - Health and Safety Requirements.
- .2 Section 01 33 00 - Submittal Procedures.

1.3 REFERENCES

- .1 National Fire Code 2015
- .2 National Building Code 2015

1.4 DEFINITIONS

- .1 Hot Work defined as:
 - .1 Welding work.
 - .2 Cutting of materials by use of torch or other open flame devices.
 - .3 Grinding with equipment which produces sparks.
 - .4 Use of open flame torches such as for roofing work.

1.5 SUBMITTALS

- .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review upon issuance of the call-up.
- .2 Submit in accordance with specification Section 01 33 00.

1.6 FIRE SAFETY REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with following:
 - .1 National Fire Code, 2010
 - .2 National Building Code 2010.
 - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.7 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented during performance of hot work, Departmental Representative will provide authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities. Each activity requiring a separately written "Authorization to Proceed" from Departmental Representative.
- .4 Requirement for individual authorization based on:
 - .1 Nature or phasing of work;
 - .2 Risk to Facility operations;
 - .3 Quantity of various trades needing to perform hot work on project or;
 - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied Facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of Facility. Follow Departmental Representative's directives in this regard.

.8 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Hot Work Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in Section 01 35 29.
 - .2 Use of a Hot Work Permit system for each hot work event.
 - .3 The step by step process of how to prepare and issue permit.
 - .4 Permit shall be issued by Contractor's site Superintendent, or other authorized person designated by Contractor, granting permission to worker or subcontractor to proceed with hot work.
 - .5 Provision of a designated person to carry-out a Fire Safety Watch for a minimum of 60 minutes immediately upon completion of the hot work.
 - .6 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
 - .7 Site specific rules and procedures in force at the site as provided by the Facility Manager.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Clearly label as being the Hot Work Procedures applicable to this contract.
- .4 Hot Work Procedures shall clearly establish responsibilities of:
 - .1 Worker(s) performing Hot Work,
 - .2 Authorized person issuing the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractors and Contractor.
- .5 Brief all workers and subcontractors on Hot Work Procedures and Permit system established for project. Stringently enforce compliance.
- .6 Failure to comply with the established procedures may result in the issuance of a stop work order as specified in Section 01 35 29.

- .1 Hot Work Permit to include, as a minimum, the following data:
 - .1 Project name and project number.
 - .2 Building name, address and specific room or area where hot work will be performed.
 - .3 Date when permit issued.
 - .4 Description of hot work type to be performed.
 - .5 Special precautions required, including type of fire extinguisher needed.
 - .6 Name and signature of permit issuer.
 - .7 Name of worker (clearly printed) to which the permit is issued.
 - .8 Time Duration that permit is valid (not to exceed 8 hours). Indicate start time and date, and completion time and date.
 - .9 Worker signature with date and time upon hot work termination.
 - .10 Specified time period requiring safety watch.
 - .11 Name and signature of designated Fire Safety Watcher, complete with time and date when safety watch terminated, certifying that surrounding area was under continual surveillance and inspection during the full watch time period specified in Permit and commenced immediately upon completion of Hot Work.
- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full and signed as follows:
 - .1 Authorized person issuing Permit before hot work commences.
 - .2 Worker upon completion of Hot Work.
 - .3 Fire Safety Watcher upon termination of safety watch.
 - .4 Returned to Contractor's Site Superintendent for safe keeping.

1.10 FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting
- .3 Costs incurred, from the fire department, Facility owner [and tenants], resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

1.11 DOCUMENTS ON SITE

- .1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.
- .2 Upon request, make available to Departmental Representative or to authorized safety representative for inspection.

1.11 MEASUREMENT FOR PAYMENT

- .1 All costs associated with this specification section will be considered incidental to the Standing Offer and will not be measured for payment.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

1.1 RELATED SECTIONS

- .1 Section 01 35 24 – Special Procedures on Fire Safety Requirements

1.2 DEFINITIONS

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
 - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
 - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
 - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4 PPE: Personal Protective Equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit Site Specific Health and Safety Plan prior to commencement of Work.
 - .1 Submit one (1) electronic copy of the Site-Specific Health and Safety Plan within two (2) work days of receipt of Call-up.
 - .2 Departmental Representatives will review Health and Safety Plan and provide comments.
 - .3 Immediately revise the Plan as appropriate after receipt of comments and resubmit.
 - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
 - .5 Submit revisions and updates made to the Plan during the course of Work.

1.3 SUBMITTALS (cont'd)

- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained, if required.
- .5 Workplace NL Clearance Letter
 - .1 Submit one (1) copy of Workplace NL Clearance Letter from the Assessment Services Department of Workplace Health, Safety and Compensation Commission (WHSCC) of Newfoundland and Labrador.
 - .2 Submit an update of Workplace NL Clearance Letter whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

1.4 COMPLIANCE

- .1 Comply with Occupational Health and Safety Requirements Act for Province of Newfoundland and Labrador, and Occupational Health & Safety Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at:
<http://laws-lois.justice.gc.ca/eng/acts/L-2/FullText.html>
 - .2 COSH can be viewed at:
<http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html>
 - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)
 - .4 "Treasury Board of Canada Secretariat (TBS): Treasury Board, Fire Protection Standard – Latest Edition <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316>
 - .5 "Canadian Standards Association (CSA):
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures."
- .3 Observe construction safety measures of:
 - .1 Part 8 of the National Building Code
 - .2 Provincial Worker's Compensation Board.
 - .3 Municipal by-laws and ordinances.

1.4 COMPLIANCE (cont'd)

- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Workplace NL Clearance Letter.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with Site Specific Health and Safety Plan.

1.6 SITE CONTROL AND ACCESS

- .1 Control the Work and Entry Points to Work Site.
 - .1 Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .2 Departmental Representative, if required, will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site, if required, from other areas of the premises by use of appropriate means.
 - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 56 00.
 - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
 - .3 Use professionally made signs with bilingual message in the two (2) official languages or international known graphic symbols.
- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.

1.6 SITE CONTROL AND ACCESS (cont'd)

- .4 Ensure persons granted site access wear appropriate PPE.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.7 PROTECTION

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazards or conditions become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 FILING OF NOTICE

- .1 The Departmental Representative will file any required Notice of Project with Provincial Department of Government Services – Occupational Health and Safety prior to beginning of Work.

1.9 PERMITS

- .1 Post permits, licenses and compliance certificates, specified in section 01 10 10.
- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.10 HAZARD ASSESSMENTS

- .1 Perform site specific health and safety hazard assessment of the Work Site and the associated work.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site.
- .3 Record results and address in Health and Safety Plan.
- .4 Keep documentation on site for entire duration of the Work.

1.11 PROJECT/SITE CONDITIONS

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
 - .1 Wet and slippery conditions
 - .2 Inclement weather conditions
 - .3 Working around or in water
 - .4 Slippery road conditions
 - .5 Heavy equipment activity
 - .6 Vehicular traffic
 - .7 Pedestrian traffic
 - .8 Heavy lifting
 - .9 Working at heights
 - .10 Open trenches
 - .11 Slip, trip and fall
 - .12 Cutting tools and other construction power tools
 - .13 Welding tools
 - .14 Hazardous materials
 - .15 Restricted or confined space
 - .16 Buried or Overhead Utilities
 - .17 Working near electrical items
 - .18 Wildlife
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
- .3 Consider all above items in the hazard assessment of the Work.

1.12 MEETINGS

- .1 Conduct a pre-construction health and safety meeting prior to commencement of Work. Ensure attendance of:
 - .1 Superintendent of Work
 - .2 Designated Health & Safety Site Representative
 - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.13 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Corporate Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.

1.13 HEALTH AND SAFETY PLAN (cont'd)

- .2 Health and Safety Plan shall include the following components:
 - .1 List of health risks and safety hazards identified by site specific hazard assessment.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-site Communication Plan as specified below.
 - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
 - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
 - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
 - .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of firefighting equipment and other related data.
 - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
 - .4 Emergency Contacts: name and telephone number of officials from:
 - .1 General Contractor and subcontractors.
 - .2 Pertinent Federal & Provincial Departments & Authorities having jurisdiction.
 - .3 Local emergency resource organizations.
 - .5 Harmonize Plan, if required, with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.
- .4 On-site Communication Plan:
 - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
 - .2 List of critical work activities which have a risk of endangering health and safety of Facility users to be communicated with Facility Manager, if required.
- .5 Address all activities of the Work including those of subcontractors.
- .6 Review Health & Safety Plan regularly. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
- .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
- .8 Post copy of the Plan, and updates, prominently on Work Site.

1.14 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
 - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.
 - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
 - .3 Conduct site safety orientation session to persons granted access to Work Site.
 - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
 - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
 - .1 Be qualified and competent person in occupational health and safety.
 - .2 Have site-related working experience specific to activities of the Work.
 - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Conduct regularly scheduled safety inspections of the Work. Record deficiencies and remedial action taken.
- .6 If required, Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

1.15 TRAINING

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
- .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.16 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
 - .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses, high-visibility work wear and hearing protection.
 - .2 Immediately report unsafe condition, near-miss accident, injury and damage
 - .3 Maintain site & storage areas in a tidy condition free of hazards.
 - .4 Obey warning signs and safety tags.

1.17 CORRECTION NON-COMPLIANCE

- .1 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.
- .2 Immediately address health and safety non-compliance issues identified by Non-Compliance authority having jurisdiction or by Departmental Representative.
- .3 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .4 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

1.18 INCIDENT REPORTING

- .1 Investigate and report incidents to Departmental Representative in a timely manner:
 - .1 All near misses, incidents or hazardous occurrences requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
 - .2 Medical aid injuries.
 - .3 Property damage,
 - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department.
- .2 Submit report in writing.

1.19 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System.
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to Departmental Representative.
 - .3 For interior work in an occupied Facility, post additional copy in one or more publically accessible locations.

1.20 BLASTING

- .1 Blasting or other use of explosives are not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

1.21 POWDER ACTUATED DEVICES

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

1.22 CONFINED SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
 - .1 Obtain permit from Facility Manager
 - .2 Keep copy of permit issued.
- .3 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.23 SITE RECORDS

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.24 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.
- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan
 - .2 Material Safety Data sheets
 - .3 Incident reports
 - .4 Tool box and safety meeting minutes
 - .5 Emergency contact information
 - .6 Acts and Regulations

1.25 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 This section outlines requirements for environmental protection associated with the work.

1.2 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.3 DEFINITIONS

- .1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.

1.4 FIRES

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

1.5 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS

- .1 Dispose at approved landfill sites as specified in Section 01 74 21.
- .2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.
- .3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
- .4 Dispose of construction waste materials and demolition debris, resulting from work, at approved landfill sites only. Carryout such disposal in strict accordance with provincial and municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.
- .5 Establish methods and undertake construction practices which will minimize waste and optimize use of construction materials. Separate at source all construction waste materials, demolition debris and product packaging and delivery containers into various waste categories in order to maximize recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a "mixed state". Where recycling firms, specializing in recycling of specific materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.

1.5 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS (Cont'd)

- .6 Communicate with landfill operator prior to commencement of work, to determine what specific waste materials have been banned from disposal at the landfill/transfer stations.

1.6 DRAINAGE

- .1 Provide temporary drainage/pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
- .4 Pumped/runoff water must meet applicable federal, provincial, and municipal standards before it can be discharged to a surface water body. If regulatory guidelines exceedences are noted, the Departmental Representative has the right to issue stop pumping instructions to the Contractor.
- .5 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good Order for duration of work.

1.7 PERMITS

- .1 All guidelines and instructions stated on permits must be strictly adhered to.

1.8 WORK ADJACENT TO WATERWAYS

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with provincial and federal environmental regulations.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not blast under water or within 100 m of spawning beds.

1.8 WORK ADJACENT TO WATERWAYS (Cont'd)

- .8 Do not refuel any type of equipment within one hundred metres (100 m) of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.

1.9 POLLUTION CONTROL

- .1 Maintain or install temporary erosion and pollution control features/methods as required.
- .2 Control emissions from equipment and plant to local authority's emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.
- .5 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
- .6 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
- .7 Report, to Federal and Provincial Department of the Environment, spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment. Also notify Departmental Representative and submit a written spill report to Departmental Representative within twenty-four (24) hours of occurrence.
- .8 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating debris.

1.10 WILDLIFE PROTECTION

- .1 Should nests of migratory birds be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.11 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Barriers.
- .2 Traffic Controls.

1.2 INSTALLATION AND REMOVAL

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

1.3 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around open excavations as required by governing authorities.
- .2 Provide barricades along wharf structure when wheelguard is removed.

1.4 ACCESS TO SITE

- .1 Provide and maintain access to adjacent facilities.

1.5 PUBLIC TRAFFIC FLOW

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

1.6 FIRE ROUTES

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

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

1.8 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .3 Prevent accumulation of wastes which create hazardous conditions.
- .4 Provide adequate ventilation during use of volatile or noxious substances.

1.2 MATERIALS

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

1.3 CLEANING DURING CONSTRUCTION

- .1 Maintain project site and public properties in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
- .2 Provide on-site garbage containers for collection of waste materials and debris.
- .3 Remove waste materials and debris from site on a daily basis.

1.4 FINAL CLEANING

- .1 In preparation for acceptance of the Work perform final cleaning.
- .2 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
- .3 Broom clean exterior paved and concrete surfaces; rake clean other surfaces of grounds.

1.11 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which it was required.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 – GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 35 43 - Environment Procedures.
- .2 Section 02 41 16 - Sitework, Demolition and Removal.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 06 05 73 - Wood Treatment.
- .5 Section 31 53 16 - Structural Timber.

1.2 WASTE MANAGEMENT PLAN

- .1 Prior to commencement of work and if requested by the Departmental Representative, prepare a Waste Management Plan.
- .2 Waste Management Plan to include:
 - .1 Procedures for sending recyclables to recycling facilities.
 - .2 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
- .3 Submit copy of Workplan to Departmental Representative for review and approval.
- .4 Make revisions to Waste Management Plan as directed by Departmental Representative.

1.3 WASTE AUDIT

- .1 Conduct waste audit, if requested by the Departmental Representative, of:
 - .1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
 - .2 Projected waste resulting from product packaging and from material leftover after installation work.

1.4 WASTE REDUCTION

- .1 Prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.

1.4 WASTE REDUCTION (Cont'd)

- .2 Identify materials and equipment to be:
 - .1 Protected and turned over to Departmental Representative when indicated.
 - .2 Salvaged for resale by Contractor.
 - .3 Sent to recycling facility.
 - .4 Sent to waste processing/landfill site for their recycling effort.
 - .5 Disposed of in approved landfill site.
- .3 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
 - .1 Use of a central cutting area to allow for easy access to off-cuts;
 - .2 Use of off-cuts for blocking and bridging elsewhere.
 - .3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials to allow for easy incorporation into work whenever possible avoiding unnecessary waste.

1.5 MATERIAL SOURCE SEPARATION PROCESS

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site, if requested by the Departmental Representative.
- .2 Provide on-site facilities as required to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
 - .1 Use suitable containers for individual collection of items based on intended purpose.
 - .2 Locate to facilitate deposit but without hindering daily operations of existing building tenants.
 - .3 Clearly mark containers and stockpiles as to purpose and use.
- .3 Perform demolition and removal of existing components and equipment following a systematic deconstruction process.
 - .1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
 - .1 Reinstallation into the work where indicated.
 - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
 - .3 Sending as many items as possible to locally available recycling facility.
 - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .5 Send leftover material resulting from installation work for recycling whenever possible.

1.5 MATERIAL SOURCE SEPARATION PROCESS (Cont'd)

- .6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.
- .7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

1.6 WORKER TRAINING AND SUPERVISION

- .1 Provide adequate training to workforce to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.
- .2 Post a copy of Plan in a prominent location on site for review by workers.

1.7 CERTIFICATION OF MATERIAL DIVERSION

- .1 Submit to Departmental Representative, if required, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.
- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

1.8 DISPOSAL REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials on-site is prohibited.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, paint, paint thinner or unused preservative material into waterways, storm, or sanitary sewers is prohibited.
- .3 Do not dispose of preservative treated wood through incineration.
- .4 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .5 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.
- .6 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.

1.8 DISPOSAL REQUIREMENTS (Cont'd)

- .7 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
- .8 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.
- .9 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
- .10 Sale of salvaged items by Contractor to other parties not permitted on site.

1.9 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment shall be made for items under this section. Include all costs incidental to the item or to the Unit Price for which demolition and removal is required.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 DESCRIPTION

- .1 This section specifies requirements for demolishing and removing, wholly or in part, various items designated to be removed or partially removed.
- .2 Demolition, removal and disposal will consist of, but not necessarily be limited to, the following items:
 - .1 Concrete, timber and steel components on marine gravity based and floating structures. These could be above water or below ground,
 - .2 Wood, concrete, metal, plastic and glass components of building structures. These could be above ground or below ground,
 - .3 Asphalt paving from roads and parking areas
 - .4 Rock, gravel, topsoil, etc.
 - .5 Concrete, timber and metal components on various site parking and landscaping structures. These could be above ground or below ground,
 - .6 Galvanized steel guide rails, treated timber guide rail posts, blocking, & associated hardware
 - .7 Signs and sign posts
 - .8 Miscellaneous other structures, items and/ or components as designated by the Departmental Representative. These could be above ground or below ground,

1.3 GENERAL REQUIREMENTS FOR MARINE PROJECTS

- .1 A Notice to Shipping is to be issued, if required by the Departmental Representative, prior to commencement and upon completion of work.
- .2 During marine construction, any vessels or barges utilized must be marked in accordance with the provisions of the Canada Shipping Act Collision Regulations.
- .3 Upon completion of a marine project, a written Notice to Mariners must be issued.

1.4 PROTECTION

- .1 Protect existing objects designated to remain. In event of damage, immediately replace or make repairs to approval of and at no additional cost to Canada.
- .2 Place a floating boom around entire site of marine demolition, if required, to prevent loss of any materials.

- .3 Remove all floating debris from water on a routine and timely basis.

1.5 MEASUREMENT FOR PAYMENT

- .1 For call-ups involving demolition for the purpose of replacing equipment or materials, no measurement for payment will be made for demolition. Consider these demolition costs incidental to cost of the item being replaced.
- .2 For call-ups for demolition purposes only, demolition and removal shall be measured for payment as calculated from actual hours of Labour worked and/ or actual hours of Heavy Equipment/ Trucks/ Miscellaneous Equipment used. All payment as per Excavating, Trenching and Backfilling – Specification Section 31 23 10 – Clause 1.4 – Measurement for Payment or Structural Timber – Specification Section 31 53 16 – Clause 1.7 – Measurement for Payment. Also include any additional costs for fees at approved waste disposal sites.
- .3 An estimate of anticipated costs must be provided for review and approval prior to starting any demolition and/ or removal.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 EXECUTION

- .1 Inspect site with Departmental Representative and verify objects designated for removal.
- .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.

3.2 REMOVAL

- .1 Demolish and remove in their entirety all materials and objects specified for removal.
- .2 Do not disturb adjacent work designated to remain in place.

3.3 DISPOSAL OF MATERIAL

- .1 All demolished materials, except materials designated to be reused, will become property of contractor and will be removed from site and disposed to satisfaction of Departmental Representative and in accordance with environmental guidelines.

- .2 It is the sole responsibility of the contractor to dispose of all demolished materials at an approved disposal site.
- .3 Ensure that disposal site is approved and willing to accommodate any materials disposed of from work site.
- .4 Contractor shall obtain and pay for all necessary permits and disposal fees for use of an approved waste disposal site.

3.4 RESTORATION

- .1 Upon completion of work, remove debris, trim surfaces and leave work site in clean condition.
- .2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 20 00 - Concrete Reinforcing.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete – Latest Edition, including all relevant updates.
 - .2 CSA-O86-09, Engineering Design in Wood – Latest Edition, including all relevant updates.
 - .3 CSA O121-17, Douglas Fir Plywood.
 - .4 CSA O151-17, Canadian Softwood Plywood.
 - .5 CSA O153-13, Poplar Plywood.
 - .6 CSA O437 Series-93, Standards for OSB and Waferboard – Latest Edition
 - .7 CSA S269.1-16 Falsework and Formwork – Latest Edition
 - .8 CAN/CSA-S269.3-M92 (R2013), Concrete Formwork – Latest Edition

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

1.4 MEASUREMENT FOR PAYMENT

- .1 Concrete Formwork and Accessories: No separate measurement for payment shall be made for items under this section. Costs to be included in the Unit Price for the associated Cast-In-Place Concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Use formwork materials to A23.1-14 (Latest Edition).
- .2 Form ties:
 - .1 Removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .3 Form release agent: non-toxic, chemically active release agents containing compounds that react with free lime present in concrete to provide water insoluble soaps, preventing set of film of concrete in contact with form.
- .4 CSA S269.1-16 (Latest Edition) Falsework and Formwork.
 - .1 Materials required to bear grade marks, or be accompanied with certificates, test reports or other proof of conformity.
- .5 Pre-moulded joint fillers:
 - .1 Bituminous impregnated fibreboard to ASTM D1751-04(2013)e1 (Latest Edition).
- .6 Bond Breaker:
 - .1 Impermeable tube formed of polyvinylchloride, rubber or similar material to the approval of the Departmental Representative. Internal diameter equal to dowels.
- .7 Sealant: to Section 07 92 10 - Joint Sealing.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms and framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1-16 (Latest Edition).
- .5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3-M92 (Latest Edition) to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by A23.1-14 (Latest Edition).

- .6 Align form joints and make watertight. Keep form joints to minimum.
- .7 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .10 Clean formwork in accordance with A23.1-14 (Latest Edition), before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 7 days for walls and sides of beams.
 - .2 7 days for columns.
 - .3 5 days for beam soffits, slabs, decks and other structural members, or 3 days when replaced immediately with adequate shoring to standard specified for falsework.
 - .4 5 days for footings and abutments.
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate re-shoring.
- .3 Provide all necessary re-shoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space re-shoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of A23.1-14 (Latest Edition).

3.3 JOINT FILLERS

- .1 Locate and form expansion joints as indicated. Install joint filler in all joints.
- .2 Use 13 mm thick joint filler to separate slab-on-grade and extend joint filler from bottom of slab to within 25 mm of finished slab surface unless indicated otherwise.

3.4 JOINT SEALANT

- .1 Fill expansion and control joints with sealer as per manufacturer instructions.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 03 30 00 - Cast-in-Place Concrete.
- .3 Section 35 59 29 - Mooring Devices.

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual (Latest Edition)
 - .1 ACI 315-99, Details and Detailing of Concrete Reinforcement.
 - .2 ACI 315R-04, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
- .2 ASTM International
 - .1 ASTM A1064/A1064M (Latest Edition) - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - .2 ASTM A143/A143M-07 (Latest Edition), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .3 ASTM A775/A775M-17 (Latest Edition), Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
 - .4 ASTM-A123/A123M-15 (Latest Edition), Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- .3 Canadian Standards Association (CSA)
 - .1 CSA-A23.1-14 / A23.2-14 (Latest Edition), Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-04 (Latest Edition), Design of Concrete Structures.
 - .3 CSA-G30.18-09 (Latest Edition), Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20-13/G40.21-13, General Requirement for Rolled or Welded Structural Quality Steels/Structural Quality Steel.
 - .5 CSA W186-M1990 (Latest Edition), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC- Latest Edition, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315-99.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Newfoundland and Labrador.
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate size, spacings & locations of chairs, spacers & hangers.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3-04 (Latest Edition), unless otherwise indicated.
 - .1 Provide type A B C tension lap splices where indicated unless otherwise indicated.

1.4 QUALITY ASSURANCE

- .1 Submit the following upon request:
 - .1 Mill Test Report: Provide Departmental Representative with certified copy of mill test report of reinforcing steel,.
 - .2 Proposed source of reinforcement material to be supplied.

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 indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

1.7 MEASUREMENT FOR PAYMENT

- .1 No separate measurement for payment shall be made for items under this section. Costs to be included in the Unit Price for the associated Cast-In-Place Concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18-09 (Latest Edition), unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18-09 (Latest Edition).
- .4 Cold-drawn annealed steel wire ties: to ASTM A1064 / A1064M (Latest Edition)
- .5 Welded steel wire fabric: to ASTM A1064 / A1064M (Latest Edition). Provide in flat sheets only.
- .6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1-14 / A23.2-14 (Latest Edition).
- .7 Mechanical splices: subject to approval of Departmental Representative.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1-14 / A23.1-14, ACI 315-99 (Latest Edition), and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R-04 (Latest Edition), Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.
- .2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186-M1990 (Latest Edition).
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to commencing reinforcing work.

2.3 SOURCE QUALITY CONTROL (Cont'd)

- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

PART 3 - EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1-14 / A23.2-14 (Latest Edition).
- .2 Use approved type chairs to locate the reinforcing steel at the proper grade.
- .3 Tie reinforcement where spacing in each direction is:
 - .1 Less than 300 mm: tie at alternate intersections.
 - .2 300 mm or more: tie at each intersection.
- .4 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .5 Ensure cover to reinforcement is maintained during concrete pour.

3.3 CLEANING

- .1 Clean reinforcing before placing concrete to CAN/CSA-A23.1-14 / A23.2-14 (Latest Edition).

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for supply, placing, finishing, protecting and curing cast-in-place concrete for foundations, slabs-on-grade, sidewalk, curbs, pedestals, reinforced concrete wharf deck, mooring cleat pedestals, anchor blocks, precast panels and precast mooring blocks.

1.2 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories.
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 35 59 29 - Mooring Devices.
- .4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C260/C260M-10a (Latest Edition), Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C309-11 (Latest Edition), Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete.
 - .3 ASTM C494/C494M-16 (Latest Edition), Standard Specification for Chemical Admixtures for Concrete.
 - .4 ASTM C1017/C1017M-13e1 (Latest Edition), Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .5 ASTM D1751-04e1 (Latest Edition), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
 - .6 ASTM D1752-04a (Latest Edition), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86 (Latest Edition), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 Canadian Standards Association (CSA International)
 - .1 CA1`N/CSA-A23.1-14/A23.2-14 (Latest Edition), Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CSA A283-06 (Latest Edition), Qualification Code for Concrete Testing Laboratories.

- .3 CAN/CSA-A3000-13 (Latest Edition), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.5 CERTIFICATES

- .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
- .2 If required, prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
 - .1 Portland cement.
 - .2 Blended hydraulic cement.
 - .3 Supplementary cementing materials.
 - .4 Grout.
 - .5 Admixtures.
 - .6 Aggregates.
 - .7 Water.
 - .8 Joint filler.
 - .9 Joint Sealant.
- .3 If required, provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1-14/A23.2-14 (Latest Edition).
- .4 If required, provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1-14/A23.2-14 (Latest Edition).

1.6 STORAGE OF MATERIALS

- .1 Store materials to prevent contamination or deterioration
- .2 Provide adequate storage facilities for materials to ensure a continuous supply of these materials during batching operations.
- .3 Store cement in weather-tight facility.

1.7 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 If required, provide Departmental Representative, prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

- .3 If required, prior to starting concrete work, submit proposed quality control procedures to Departmental Representative for the following items:
 - .1 Cold weather concrete.
 - .2 Curing.
 - .3 Finishes.
 - .4 Formwork removal.
 - .5 Joints.
 - .6 Falsework Erection

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: deliver to site of work and discharge within 120 minutes maximum after batching
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1-14/A23.2-14 (Latest Edition).
 - .2 Deviations to be submitted for review by the Departmental Representative
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1-14/A23.2-14 (Latest Edition).

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Use trigger operated spray nozzles for water hoses.
- .2 Designate a cleaning area for tools to limit water use and runoff.
- .3 Carefully coordinate the specified concrete work with weather conditions.
- .4 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .5 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.
- .6 Choose least harmful, appropriate cleaning method which will perform adequately.

1.10 MEASUREMENT FOR PAYMENT

- .1 Reinforced Concrete Foundations: Supply and installation of reinforced concrete foundations to be measured in cubic metres (M³) calculated from actual field measurements, excluding areas occupied by openings. Contractor to provide all materials, labour, plant and equipment including reinforcing steel and control joints.

- .2 Reinforced Concrete Slabs-on-Grade (Various Thicknesses): Supply and installation of reinforced slabs-on-grade to be measured in square metres (M^2) calculated from actual field measurements, excluding areas occupied by pedestals. Contractor to provide all materials, labour, plant and equipment including reinforcing steel, expansion joints and control joints.
- .3 Non-Reinforced Concrete Slabs-on-Grade (Various Thicknesses): Supply and installation of non-reinforced slabs-on-grade to be measured in square metres (M^2) calculated from actual field measurements, excluding areas occupied by pedestals. Contractor to provide all materials, labour, plant and equipment including expansion joints, isolation joints and control joints.
- .4 Concrete Sidewalk (150 mm thick): Supply and installation of non-reinforced sidewalk to be measured in square metres (M^2) calculated from actual field measurements, excluding areas occupied by pedestals. Contractor to provide all materials, labour, plant and equipment including expansion joints, isolation joints and control joints.
- .5 Non-Reinforced Concrete Curbs (Various Sizes): Supply and installation of non-reinforced curbs to be measured in cubic metres (M^3) calculated from actual field measurements. Contractor to provide all materials, labour, plant and equipment including expansion joints, isolation joints and control joints.
- .6 Reinforced Concrete Pedestals: Supply and installation of reinforced concrete pedestals to be measured in cubic metres (M^3) calculated from actual field measurements. Contractor to provide all materials, labour, plant and equipment including reinforcing steel and anchor bolts.
- .7 Reinforced Concrete Deck (Various Thicknesses): Supply and installation of reinforced concrete deck to be measured in square metres (M^2) calculated from actual field measurements, excluding area occupied by jib crane foundations, Type "A" mooring cleat pedestals, Type "B" mooring cleat pedestals and coping. Contractor to provide all materials, labour, plant and equipment including reinforcing, expansion joints, isolation joints and control joints
- .8 Concrete Mooring Cleat Pedestals – Type "B1": Supply and installation of reinforced concrete mooring cleat pedestals to be measured by the unit (Each) as calculated from the number of mooring cleats pedestals actually installed. Contractor to provide all materials, labour, plant and equipment including reinforcing steel and anchor bolts.
- .9 Concrete Anchor Blocks, Precast Panels and Mooring Blocks (Various Sizes): Supply and installation of reinforced concrete to be measured in cubic metres (M^3) calculated from actual field measurements. Contractor to provide all materials, labour, plant and equipment including reinforcing and lifting hardware.
- .10 No separate payment will be made for any other ingredient or feature of concrete work. All factors, including curing, cold weather placement, caulking and joint filler for expansion, isolation and control joints, will be considered as being incidental in the unit price for that item.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Cement to CSA A3001-13, Type GU (Latest Edition).
- .2 Supplementary cementing materials: to CSA A3001-13 (Latest Edition).
- .3 Cementitious hydraulic slag: to CSA A3001-13 (Latest Edition).
- .4 Water: to CSA-A23.1-14/A23.2-14 (Latest Edition).
- .5 Aggregates: to CSA-A23.1-14/A23.2-14 (Latest Edition). Coarse aggregates to be normal density.
- .6 Air entraining admixture: to ASTM C260/C260M-(2016)10a (Latest Edition).
- .7 Chemical admixtures: to ASTM C494/C494M-16 (Latest Edition). Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .8 Concrete retarders: to ASTM C494/C494M-16 (Latest Edition). Do not allow moisture of any kind to come in contact with the retarder film.
- .9 Curing compound: curing compounds are not to be used.
- .10 Pre-moulded joint fillers:
 - .1 Bituminous impregnated fiber board: to ASTM D1751-04e1 (Latest Edition).
 - .2 Sponge rubber: to ASTM D1752-04a (Latest Edition), Type I, flexible grade.
- .11 Concrete Pumps and Placing Booms: to CAN/CSA-Z151-09 (Latest Edition).

2.2 MIXES

- .1 Proportion concrete in accordance with CSA-A23.1-14, Clause 4.3 (Latest Edition).
- .2 Proportion concrete to comply with Alternate 1, Table 2 in CSA-A23.1-14 (Latest Edition) and following requirements:
 - .1 Cement:
 - .1 Type GU Portland cement.
 - .2 Minimum compressive strength: 35 MPa at
 - .3 Class of exposure: C1.
 - .4 Minimum cement content: 385 kg/m³ of concrete.
 - .5 20 mm nominal size coarse aggregate.
 - .6 Air content 5% to 8%.
 - .7 Density of air-dry concrete in range of 2240 kg/m³ to 2400 kg/m³.
 - .8 Slump at time and point of discharge 50 mm to 100 mm.

- .3 When the Contractor wishes to purchase concrete from a ready mix concrete supplier, submit a letter from the supplier certifying the following:
 - .1 That plant and equipment is certified and all materials to be used in the concrete comply with the requirements of CSA-A23.1-14 (Latest Edition).
 - .2 That the mix proportions selected will produce concrete of the specified quality and yield. Indicate mix proportions and sources of all materials.
 - .3 That the strengths will comply with the strengths specified herein.
- .4 When the Contractor wishes to mix concrete on site, identify the source of aggregates and submit samples of fine and coarse aggregates to a testing laboratory for testing and trial mixes in order to determine a suitable mix design. The testing laboratory, at Contractor's cost, will test the trial mix for slump, air content, density and strength. The results of these tests will be submitted to the Departmental Representative to be reviewed for compliance with the specification. This review must be completed before permission to place concrete is given.
 - .1 The sand, gravel, water and air entraining agent should be mixed prior to the addition of cement and water reducer.
- .5 Weigh aggregates, cement, water and admixture when batching. No alternative methods of measuring will be permitted.
- .6 Do not use calcium chloride.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Obtain Departmental Representative's approval before placing concrete. Provide twenty-four (24) hours notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 Concrete Reinforcing.
- .3 Pumping of concrete is permitted only after approval of equipment and mix.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, and air temperature and test samples taken.

- .8 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout epoxy grout to anchor and hold dowels in positions as indicated.
- .9 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 CONSTRUCTION

- .1 Comply with additional requirements of CSA-A23.1-14, Clause 4.1.1.5 (Latest Edition), for concrete exposed to seawater environments.
- .2 Minimum concrete cover over reinforcing steel bars to be 75 mm.
- .3 Place concrete in hot weather to CSA-A23.1-14/A23.2-14 (Latest Edition).
- .4 Place concrete in cold weather to CSA-A23.1-14/A23.2-14 (Latest Edition).
- .5 Keep concrete surfaces moist continually during protection stage.
- .6 Place, consolidate, finish, cure and protect concrete to CSA-A23.1-14 (Latest Edition).
- .7 Do not commence placing concrete until Departmental Representative has inspected and approved forms, foundations, reinforcing steel, joints, conveying, spreading, consolidation and finishing equipment and curing and protective methods.

3.3 FORMWORK

- .1 Install and strip formwork to CSA-A23.1-14 (Latest Edition) and Section 03 10 00.

3.4 INSERTS

- .1 Position and secure anchor bolts and dowels in formwork to maintain line and grades.

3.5 EXPANSION JOINTS, ISOLATION JOINTS AND CONTROL JOINTS

- .1 Construct expansion joints, isolation joints and control joints in locations shown on drawings or directed by Departmental Representative.
- .2 All joints will be centred over a support. Joints will be made in a perfectly straight line.
- .3 Cut control joint when concrete has hardened.
- .4 Fill saw cut with joint sealer as specified.

3.6 PLACING CONCRETE

- .1 Place and consolidate concrete to CSA-A23.1-14/A23.2-14 (Latest Edition).
- .2 Do not place concrete on or against frozen material.
- .3 Place concrete continuously from joint to joint.
- .4 Place concrete in a uniform heading, normal to the centreline. Limit rate of placing to that which can be finished before beginning of initial set.

3.7 STRIKE OFF AND CONSOLIDATION

- .1 High speed internal poker vibrators shall be used to consolidate the concrete during placing. Final compaction of the surfaces shall be done by beam-type vibratory air screed as approved by Departmental Representative. A surcharge of approximately 65 mm of concrete will be maintained at the screed face during consolidation.
- .2 Strike-off and consolidation must be completed before excess water bleeds to the surface.
- .3 Ensure that the concrete deck conforms to the elevations and slopes as shown on the drawings so that satisfactory drainage will result.

3.8 FINISHING

- .1 Only ACI certified or other pre-approved concrete finishers are to be utilized in finishing all concrete works. All work is to be finished to CSA-A23.1-14/A23.2-14 (Latest Edition), and as specified below.
- .2 The surface will be brought to the specified level by means of darbying or bull floating which will be carried out immediately following screeding and must be completed before any bleed water is present on the surface. Surface tolerance to be 8 mm under a 3 metre straight edge.
- .3 Provide slope as shown on the drawings to permit proper drainage of the concrete deck.
- .4 Finish slabs to elevations indicated on drawings.
- .5 Strike off the surface with a straight edge.
- .6 Hand tamp low slump concrete.
- .7 Darby or bull float the surface to smooth and level the concrete.
- .8 Allow bleed water or sheen to disappear.

- .9 Float the surface by means of power and/or hand float where the concrete has hardened enough for a man to leave only slight footprints on the surface.
- .10 Do not bring water and fines to the surface by over floating. Where extra floating is required the floating operation shall be repeated after the time interval necessary for any sheen to disappear and for concrete to set further.
- .11 Steel trowel the concrete surfaces by means of power and/or hand trowel. Do not leave any hard, smooth, polished or burnished surface area.
- .12 Do not bring water and fines to the surface by over trowelling.
- .13 After slight interval necessary for concrete to further harden, repeat the trowelling operation if required.
- .14 Lightly broom surface with a soft bristle broom obtaining a fine and even textured finish with a non-slip finish. All brush strokes to be parallel across paving.
- .15 The surface shall be true and accurate to a maximum tolerance of 1 mm in 500 mm.

3.9 PROTECTION AND CURING

- .1 Cure to CSA-A23.1-14/A23.2-14 (Latest Edition).
- .2 Cure concrete by protecting it against loss of moisture, rapid temperature change and mechanical injury for at least 7 days after placement. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by whatever curing medium is applicable to local conditions and approved by the Departmental Representative. The edges of concrete slabs exposed by removal of forms shall be protected with continuous curing treatment equal to the method selected for curing the slab and curb surfaces. Cure to CSA-A23.1-14 (Latest Edition). Have the equipment needed for adequate curing at hand and ready to install before actual concrete placement begins.
- .3 When air temperature is at or below 5°C or when there is a probability of its falling to that limit within 24 hours of placing (as forecast by the nearest official meteorological office) cold weather protection as per CSA-A23.1-14 (Latest Edition) will be provided and the following:
 - .1 Housing - Protect concrete by a windproof shelter of canvas or other material to allow free circulation of inside air around fresh touch formwork and provide sufficient space for removal of formwork for finishing. Supply approved heating equipment capable of keeping inside air at a constant temperature sufficiently high to maintain concrete at following curing temperatures.
 - .1 For initial 3 days at a temperature of not less than 15°C nor more than 27°C at surface.
 - .2 Maintain concrete at 10°C for an extra 4 days plus the initial 3 days.
 - .3 In addition to the protective housing, the concrete must be cured as outlined in Clause 3.9.2 above.

3.10 TESTING

- .1 Departmental Representative will appoint a concrete testing company to test all work under this section of specification as per CSA-A23.1-14/A23.2-14 (Latest Edition).
- .2 Cost of compressive strength tests shall be paid for by the Departmental Representative.
- .3 Testing company shall issue reports to Departmental Representative on quality of test cylinders.
- .4 Notify Departmental Representative in adequate time prior to start of placing concrete.
- .5 At least one (1) set of three (3) cylinders each shall be taken from twenty-five cubic metres (25 m³) or fraction thereof of each day's pour, whichever is less. One (1) cylinder shall be tested at seven (7) days and other two (2) tested at twenty-eight (28) days.
- .6 Crate cylinders and deliver to the testing laboratory within forty-eight (48) hours after casting in accordance with CSA-A23.1-14/A23.2-14 (Latest Edition). Contractor will pay for crating and delivery of cylinders to the laboratory.
- .7 If strength tests of test cylinder for any portion of the work falls below the specified compressive strength at twenty-eight (28) days, the Departmental Representative reserves the right to determine the acceptability of the concrete by performing additional field testing as outlined in CSA-A23.1-14/A23.2-14 (Latest Edition).
- .8 If concrete does not conform to drawings or specifications, take measures as directed to correct the deficiency. All costs of correctional measures will be at the expense of the Contractor.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Wood-Preservers' Association (AWPA)
 - .1 AWWA M2-16 (Latest Edition), Standard for Inspection of Treated Wood Products.
 - .2 AWWA M4-16 (Latest Edition), Standard for the Care of Preservative-Treated Wood Products.
- .2 Canadian Standards Association (CSA)
 - .1 CSA O80 Series-15 (Latest Edition), Wood Preservation.
 - .2 CSA O80.201-97 (Latest Edition), Standard for Hydrocarbon Solvents for Preservatives.
- .3 CSA O322-15 (Latest Edition), Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

1.2 QUALITY ASSURANCE

- .1 Testing of products treated with preservative by pressure impregnation will be carried out by the manufacturer's testing laboratory to AWWA M2-16 (Latest Edition) Standard for Inspection of Treated Wood Products, and revisions specified in CSA O80 Series-15, Supplementary Requirements to AWWA M2-16 (Latest Edition).
- .2 Inspection and testing of timber materials will be carried out by the manufacturer.

1.3 CERTIFICATES AND ASSAY RETENTION RESULTS

- .1 If requested, submit certificates and assay retention results in accordance with Section 01 33 00 - Submittal Procedures.
- .2 If requested, for products treated with preservative by pressure impregnation, submit following information certified by authorized signing officer of treatment plant:
 - .1 Information listed in AWWA M2-16 (Latest Edition) and revisions specified in CSA O80 Series-15, Supplementary Requirement to AWWA M2-16 (Latest Edition) applicable to specified treatment.
 - .2 Moisture content after drying following treatment with water-borne preservative.
 - .3 Assay retentions results representing each treated batch of supplied timber.
 - .4 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Do not dispose of preservative treated wood through incineration.

1.4 WASTE MANAGEMENT AND DISPOSAL (Cont'd)

- .2 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .3 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Departmental Representative.
- .4 Dispose of unused wood preservative material at official hazardous material collections site approved by Departmental Representative.
- .5 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

1.5 MEASUREMENT FOR PAYMENT

- .1 No measurement for payment to be made under this section. Include costs incidental in the unit prices for items in which wood treatment is required.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Preservative: to CSA-O80 Series-15 (Latest Edition).
- .2 Solvent: to CSA-O80.201-97 (Latest Edition).

2.2 PRESERVATIVE TREATMENTS

- .1 Treat to CSA 080, commodity standard 080.18 (Latest Edition), Table 1 and its referenced standards, with the following minimum assay retentions:

<u>Species</u>	<u>CCA</u> <u>kg/m3</u>	<u>ACA</u> <u>kg/m3</u>
Dimension Timber		
-Coast Douglas Fir	24	24
-Western/Eastern Hemlock	24	24
-Hemlock, Douglas Fir (Wheelguard, WG Blocking)	10	10

PART 3 - EXECUTION

3.1 FIELD TREATMENT

- .1 Handle pressure treated material in a manner that will avoid damage which may expose untreated material. Rejection of any damaged material may result and replacement will be at the Contractor's expense.
- .2 Fill all bored bolt holes with preservative immediately after boring. Use a pressurized container with hose to apply preservative, or some alternate method acceptable to the Departmental Representative.
- .3 Fill all unused bored holes and spike holes with tight fitting treated wooden plugs.

3.2 CUTTING

- .1 Field cuts, if authorized, are to receive three (3) liberal coats of the applicable preservative applied to dry wood on each application.

3.3 FIELD QUALITY

- .1 Timber which contain rot, splits exposing untreated wood, excessive wane, or timbers which cannot be fastened in the work so as to be structurally sound are unacceptable.
- .2 The Departmental Representative reserves the right to carry out field testing of treated timber for penetration and retention of preservative. Timber not meeting the requirements of the specification may be rejected for use under the contract.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 REFERENCES

- .1 CGSB 19-GP-5M (Latest Edition), Sealing Compound, One Component, Acrylic Base, Solvent Curing
- .2 General Services Administration (GSA)
FS-SS-S-200E (Latest Edition), Federal Specification: Sealants, Joint, Two-component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, (Latest Edition) (TDGA).

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's product to describe.
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Manufacturer's instructions
 - .1 Instructions to include installation instructions for each product used.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 PROJECT CONDITIONS

- .1 Environmental Limitations:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above five (5) degrees Celsius.
 - .2 When joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Joint-Width Conditions:
 - .1 Proceed with installation of joint sealants only where joint widths are not more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Health Canada.

1.8 MEASUREMENT FOR PAYMENT

- .1 Expansion Joints, Isolation Joints and Control Joints - New Concrete: No measurement for payment will be made under this section. Include costs incidental in items of work for which joints are required.
- .2 Expansion Joints, Isolation Joints and Control Joints – Repair/Replacement: Will be measured by the linear meter (LM) calculated from actual field measurements. Contractor to provide all materials, labour, plant and equipment required to remove and replace specified joint material for expansion and control joints

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

- .1 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Polysulfide Two Part.
 - .1 Self-Leveling to CAN/CGSB-19.24-M90 (Latest Edition), Type 1, Class B, colour to match concrete.
- .2 Polysulfide Two Part.
 - .1 Non-Sag to CAN/CGSB-19.24-M90 (Latest Edition), Type 2, Class B, colour to match concrete.
- .3 Preformed Compressible and Non-Compressible back-up materials.
 - .1 Polyethylene, Urethane, Neoprene or Vinyl Foam.
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 to 50%.
 - .2 Neoprene or Butyl Rubber.
 - .1 Round solid rod, Shore A hardness 70.
 - .3 High Density Foam.
 - .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - .4 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

PART 3 – EXECUTION

3.1 PROTECTION

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

3.2 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

3.2 SURFACE PREPARATION (Cont'd)

- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

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

3.4 BACKUP MATERIAL

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

3.5 MIXING

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

3.6 APPLICATION

- .1 Sealant.
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.

- .2 Curing.
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .3 Cleanup.
 - .1 Clean adjacent surfaces immediately and leave Work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 23 25 - Rock and Gravel Fill.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-13 (Latest Edition), Standard Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-14 (Latest Edition), Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63(Latest Edition), Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-12e2 (Latest Edition), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbs/ft³) (600 kN-m/m³).
 - .5 ASTM D4318-10e1 (Latest Edition), Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-14/A23.2-14 (Latest Edition), Concrete Materials and Methods of Concrete Construction.

1.3 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock: any solid material in excess of 0.25 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4 Unsuitable materials:
 - .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.

- .3 Frost susceptible materials:
- .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318-10e1 (Latest Edition), and gradation within limits specified when tested to ASTM D422-63 (Latest Edition) and ASTM C136-14 (Latest Edition): Sieve sizes to CAN/CGSB-8.1-88 (Latest Edition).
 - .2 Table:

<u>Sieve Designation</u>	<u>% Passing</u>
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45
 - .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .5 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 MEASUREMENT FOR PAYMENT

- .1 Payment for services will be based on rates and estimated quantities shown in Unit Price Table.
- .2 Mobilization and Demobilization – Heavy Equipment – Contractor Owned: (Loader, Excavator, Dozer, Rubber Tire Backhoe, etc.) The mobilization and demobilization of required Heavy Equipment will be paid by the kilometre (KM) for the one-way distance from home base to work site, from work site to work site and from work site to home base, as applicable and as authorized by the Departmental Representative, for each piece of heavy equipment used.
- .3 Mobilization and Demobilization – Tandem Dump Trucks – Contractor Owned: The mobilization and demobilization of Tandem Dump Trucks owned by the Contractor will be paid by the kilometre (KM) for the one-way distance from home base to work site, from work site to work site and from work site to home base, as applicable and as authorized by the Departmental Representative, for each Tandem Dump Truck used.
- .4 There will be no measurement for payment made for Mobilization and/or Demobilization of Heavy Equipment or Tandem Dump Trucks which are owned by others.

- .5 Heavy Equipment Rental Allowance – Contractor Owned: (Loader, Excavator, Dozer, Rubber Tire Backhoe, etc.) The supply of heavy equipment owned by the Contractor, including operator, will be paid at the fair and reasonable industry rate as pre-approved by the Departmental Representative. There will be no Overhead and Profit Allowance for heavy equipment owned by the Contractor. All quotes and/or costs must be pre-approved by the Departmental Representative prior to mobilization of equipment.
- .6 Heavy Equipment Rental Allowance – Owned by Others: (Loader, Excavator, Dozer, Rubber Tire Backhoe, etc.) The rental of heavy equipment owned by others, including operator, will be paid at the fair industry rate according to the actual invoiced cost, plus an overhead and profit allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Heavy Equipment Rental Allowance principle to determine the total Heavy Equipment Rental Allowance Cost. The Contractor must make every effort to obtain the best price available for any equipment rental. All quotes and/or costs must be pre-approved by the Departmental Representative prior to equipment rental. All costs to be supported with adequate documentation.
- .7 Tandem Dump Truck Rental Allowance – Contractor Owned: The supply of a Tandem Dump Truck owned by the Contractor, including operator, will be paid at the fair and reasonable industry rate as pre-approved by the Departmental Representative. There will be no Overhead and Profit Allowance for Tandem Dump Trucks owned by the Contractor. All quotes and/or costs must be pre-approved by the Departmental Representative prior to mobilization of equipment.
- .8 Tandem Dump Truck Rental Allowance – Owned by Others: The rental of a Tandem Dump Truck owned by others, including operator, will be paid at the fair industry rate according to the actual invoiced cost, plus an overhead and profit allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Truck Rental Allowance principle to determine the total Truck Rental Allowance Cost. The Contractor must make every effort to obtain the best price available for any trucks rental. All quotes and/or costs must be pre-approved by the Departmental Representative prior to equipment. All costs to be supported with adequate documentation.
- .9 Miscellaneous Travel Allowance: Occasionally travel may be required from the Island of Newfoundland to mainland Labrador and return. The provision of miscellaneous travel required to move equipment and personnel to and from any of these sites will be paid according to the actual invoiced cost, including only appropriate taxes, as pre-approved by the Departmental Representative. All costs will be supported by adequate documentation. There will be an Overhead and Profit Allowance for the provision of miscellaneous travel. The Contractor's Overhead and Profit Factor will be entered in the space provided on the Unit Price Table when bidding this item. The Overhead and Profit Factor will then be multiplied by the Miscellaneous Travel Principal to determine the Miscellaneous Travel Allowance.
- .10 Accommodations and meals at the individual identified project locations to be incidental to all of the above pay items.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Type 1 fill: to the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to ASTM C136-14. Sieve sizes to CAN/CGSB-8.1-88.
- .2 Type 2 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Table

Sieve Designation	% Passing
	Type 1
101.6 mm	100
50 mm	75-100
4.75 mm	25-55
1.2 mm	10-35
0.3 mm	5-20
0.075 mm	0-12

PART 3 - EXECUTION

3.1 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits proposed excavation in order that surface may break evenly and cleanly

3.2 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove all cribwork and other obstructions encountered during excavation in accordance with Section 02 41 16 – Site work, Demolition and Removal.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Dispose surplus & unsuitable excavated material in approved location off site.

- .5 Do not obstruct flow of surface drainage.
- .6 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .7 Notify Departmental Representative when bottom of excavation is reached.
- .8 Obtain Departmental Representative's approval of completed excavation.

3.3 FILL TYPES AND COMPACTION

- .1 Use fill of types as indicated.

3.4 BACKFILLING

- .1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.

3.5 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .3 Restore site to its normal state prior to excavation.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 23 10 - Excavating, Trenching, and Backfilling.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 29 - Health and Safety Requirements.
- .4 Section 01 35 43 - Environmental Procedures.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM): Latest Edition
 - .1 ASTM C117 (Latest Edition), Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136 (Latest Edition), Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422 (Latest Edition), Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698 (Latest Edition), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).
 - .5 ASTM D4318 (Latest Edition), Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian Standards Association (CSA International); Latest Edition:
 - .1 CAN/CSA-A3000 (Latest Edition), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005):
 - .1 CSA-A3001 (Latest Edition), Cementitious Materials for Use in Concrete
 - .2 CAN/CSA-A23.1/A23.2 (Latest Edition), Concrete Materials and Methods of Concrete Construction/ Methods of Test for Concrete
 - .3 Government of Newfoundland and Labrador - Department of Transportation and Works Highway Design Division - Highways Specification Book (Latest Edition).
- .3 Canadian Environmental Protection Act (Available on-line Government of Canada Website).
- .4 Newfoundland and Labrador Environmental Act and Regulations.
- .5 Government of Newfoundland and Labrador - Department of Transportation and Works:
 - .1 Government of Newfoundland and Labrador - Department of Transportation and Works Highway Design Division - Highways Specification Book (Latest Edition).
- .6 Occupational Health & Safety Act - Province of Newfoundland and Labrador

1.3 DEFINITIONS

- .1 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .2 Fill material: rock fill meeting the requirements specified.
- .3 Fine grained soils: Soils with plasticity index less than 10 when tested to ASTM D4318 (Latest Edition), and gradation within limits specified when tested to ASTM D422 (Latest Edition) and ASTM C136# (Latest Edition).
- .4 Coarse grained soils: Soils containing more than 20 % by mass passing 0.075 mm sieve
- .5 Unsuitable materials (USM).
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

1.5 MEASUREMENT FOR PAYMENT

- .1 Rock Fill: Supply, placement, and compaction of rock fill will be measured by the cubic metre (CMPM). The volume of material will be determine in place from measurements taken prior to and at completion of the work. Include the cost of rock fill all plant, labour, tandem dump trucks, heavy equipment, miscellaneous equipment and materials required to complete the work as specified.
- .2 Gravel Fill: Supply, placement, and compaction of gravel fill will be measured by the cubic metre (CMPM). The volume of material will be determine in place from measurements taken prior to and at completion of the work. Include the cost of all plant, labour, tandem dump trucks, heavy equipment, miscellaneous equipment and materials required to complete the work as specified.
- .3 Contractor, in consultation with the Departmental Representative, will make own assessment of the quantity of rock and gravel fill that is required.

PART 2 - PRODUCTS

2.1 ROCK FILL

- .1 Rock fill will be of hard, durable, evenly graded blasted stone having a maximum diameter of 300 mm in major portion of fill and a maximum diameter of 150 mm in upper 600 mm of rock fill. Fill material will contain no more than 6 percent by weight passing the 25 mm sieve. Rock fill to be evenly graded within the limits specified.
- .2 Use of shale rock or slate will not be permitted.

2.2 GRAVEL FILL

- .1 Gravel fill will consist of hard, durable, particles of stone mixed with suitable binding material. It shall be free from flat, elongated particles and shall be well graded. When tested by means of laboratory sieves it shall fulfill requirements as follows:

Sieve Size		% by Weight Passing
56	mm	100
16	mm	45-80
4.75	mm	25-55
1.25	mm	10-35
0.300	mm	5-15
0.075	mm	3-8

2.3 MATERIALS

- .1 Materials require approval by Departmental Representative.
- .2 Material used contain 3% or less organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.
- .3 Materials to consist of acceptable earth material and processed rock material free from objectionable quantities of organic matter, frozen soil, stumps, trees, moss, and other unsuitable materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that condition of substrate is acceptable for Work:
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Notify Departmental Representative when waste materials are encountered and remove to depth and extent directed.
- .4 Proceed with placement only after unacceptable conditions have been remedied

.2 DRAINAGE

- .1 Maintain profiles, crowns and cross slopes to provide good surface drainage.
- .2 If required, provide ditches as work progresses to provide drainage.

3.1 PLACING ROCK FILL

- .1 Only rock fill material approved by Departmental Representative will be placed. Material will be placed uniformly across full cross-section in layers not exceeding 300 mm loose depth.
- .2 Use suitable earthmoving and surface grading equipment to place and spread rock fill in continuous and uniform horizontal layers.
- .3 Compact rock fill after each 300 mm lift.
- .4 Place rock fill to 300 mm below bottom of finished grade.
- .5 All side slopes to be placed as per the direction of the Departmental Representative.

3.2 PLACING GRAVEL FILL

- .1 Top 300 mm of fill will consist of gravel fill as specified in Clause 2.2.1 of this section.
- .2 Place gravel fill in two (2) equal lifts to minimum 95% standard proctor density.

3.3 EMBANKMENTS

- .1 Do not place material which is frozen nor place material on frozen surfaces.
- .2 Drain low areas before placing materials.

3.6 FINISHING

- .1 Ensure all finish slopes, grades are true to lines, grades and drawings where applicable. Scale slopes by removing loose fragments,
- .2 Hand finish slopes that cannot be finished satisfactorily by machine.

3.7 PROTECTION

- .1 Maintain finished surfaces in condition conforming to this section until acceptance by Departmental Representative.
- .2 Provide silt fences and erosion protection as required to mitigate and prevent impacts to adjacent properties

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for supply and installation of structural Timber as follows:
 - .1 Supply and installation of various wharf components (treated dimension timber wheelguard, wheelguard blocking, coping, guiderail posts, pile caps, beams, wales, wale splice blocking, wale supports, cross bracing, wood decking).
 - .2 Installation of various "Owner Supplied" wharf components (treated dimension timber wheelguard, wheelguard blocking, coping, guiderail posts, pile caps, beams, wales, wale splice blocking, wale supports, cross bracing, wood decking).
 - .3 Supply and installation of untreated dimension hardwood timber fenders, chocks and ladders.
 - .4 Installation of "Owner Supplied" untreated dimension hardwood timber fenders, chocks and ladders.
 - .5 Supply of manpower to carry out miscellaneous labour as required.
 - .6 Supply of miscellaneous material as required.
 - .7 Supply or rental of miscellaneous specialized equipment or tools as required.
 - .8 Supply or rental of boom truck as required.
 - .9 Supply or rental of heavy construction equipment as required.

1.2 RELATED WORK

- .1 Section 02 41 16 - Sitework, Demolition and Removal.
- .2 Section 06 05 73 - Wood Treatment.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A307-14 (Latest Edition), Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.
 - .2 ASTM-A123/A123M-15 (Latest Edition) Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- .2 American Wood-Preserver's Association (AWPA)
 - .1 AWPA M4-15 (Latest Edition), Standard for the Care of Preservation - Treated Wood Products.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111 (Latest Edition), Wire Nails, Spikes and Staples.
 - .2 CSA-G40.20/G40.21-13 (Latest Edition), General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.
 - .3 CAN/CSA G164-M92(Latest Edition), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CAN/CSA-O80 (Latest Edition) Series-15, Wood Preservation.

- .4 Canadian Wood Council
 - .1 Wood Design Manual.
- .5 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber (Latest Edition).

1.4 DIMENSIONS

- .1 Check existing site dimensions and report discrepancies to Departmental Representative before commencing work.

1.5 PROTECTION

- .1 Avoid dropping, bruising or breaking of wood fibres.
- .2 Avoid breaking surfaces of treated timber.
- .3 Do not damage surfaces of treated timber by boring holes or driving nails or spikes into them to support temporary material or staging.
- .4 Treat cuts, breaks or abrasions on surfaces of treated timber with 3 brush coats of preservative to CAN/CSA O80-15 (Latest Edition).
- .5 Treat bolt holes, cut-offs and field cuts in accordance with CAN/CSA O80-15 (Latest Edition).

1.6 DELIVERY AND STORAGE

- .1 Store timber horizontally, evenly supported and open piled permit circulation when stored for prolonged period.
- .2 When handling long timber, provide support at sufficient number of points, properly located to prevent damage due to excessive bending.
- .3 Handle treated timber with hemp, manila or sisal rope slings or other approved means of support that will not damage surface.
- .4 Do not use sharp pointed tools to handle treated timber. Any timber so handled will be rejected and be replaced at Contractor's expense.

1.7 MEASUREMENT FOR PAYMENT

- .1 Treated Dimension Timber (Contractor Supplied): The supply and installation of treated dimension timber for coping, pile caps, beams, wales, wale splice blocking, wale supports, cross-bracing, cribwork timbers, wheelguard and wheelguard blocking will be measured by the cubic metre (m^3) of timber secured in place, including all timber, fastenings, labour, plant and equipment. Also included are wheelguard bolt hole levelling sealant and painting of wheelguard and wheelguard blocking.
- .2 Untreated Dimension Hardwood Timber (Contractor Supplied): The supply and installation of untreated dimension hardwood timber for hardwood fenders, chocks and ladder uprights as specified will be measured by the cubic metre (m^3) of timber secured in place, including all timber, fastenings, labour, plant and equipment. Also included are ladder rungs, ladder handgrips and painting of tops of fenders and ladder uprights.
- .3 Treated Dimension Timber - Owner Supplied: The installation of treated dimension timber supplied by the owner for wheelguard, wheelguard blocking, coping, guiderail posts, pilecaps, beams, wales, wale splice blocking, wale supports and cross bracing, will be measured by the cubic metre (m^3) of timber secured in place, including all timber, fastenings, plant, material, equipment, labour, wheelguard bolt hole levelling sealant, painting of wheelguard and wheelguard blocking.
- .4 Untreated Dimension Hardwood Timber - Owner Supplied: The installation of untreated dimension hardwood timber supplied by the owner for hardwood fenders, chocks, and ladders as specified will be measured by the cubic metre (m^3) of timber secured in place including all timber, fastenings, plant, material, equipment, and labour, ladder rungs, wheelguard hand grips, and painting of tops of fenders and ladder uprights.
- .5 Wood Decking - Contractor Supplied: Supply and installation of wood decking to be measured in square meters (m^2) calculated from actual field measurements. Contractor to provide all plant, labour and materials to perform the work.
- .6 Wood Decking - Owner Supplied: Installation of wood decking supplied by the owner to be measured in square meters (m^2) calculated from actual field measurements. Contractor to provide all plant, labour and materials to perform the work.
- .7 Miscellaneous Material Allowance: The supply of miscellaneous materials will be paid at the fair market value according to the actual invoiced cost delivered to site, plus an Overhead and Profit Allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Miscellaneous Material Allowance principle to determine the total Miscellaneous Material Allowance Cost. The Contractor must make every effort to obtain the best price available for any specified material. All costs to be supported with adequate documentation
- .8 Miscellaneous Equipment Rental Allowance (Contractor Owned): The supply of specialized miscellaneous equipment or tools owned by the Contractor will be paid at the fair and reasonable industry rate as pre-approved by the Departmental Representative. There will be no Overhead and Profit Allowance for equipment owned by the Contractor.

- .9 Miscellaneous Equipment Rental Allowance (Owned by Others): The supply of specialized miscellaneous equipment and tools owned by others will be paid at the fair industry rate according to the actual invoiced cost plus an Overhead and Profit Allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Miscellaneous Equipment Rental Allowance principle to determine the total Miscellaneous Equipment Rental Allowance Cost. The Contractor must make every effort to obtain the best price available for any equipment rental. All quotes and/or costs must be pre-approved by the Departmental Representative prior to equipment rental. All costs to be supported with adequate documentation.
- .10 Labour: The supply of labour for miscellaneous work not covered under other pay items will be measured by the actual labour hours (LH) worked as pre-approved by the Departmental Representative. All costs will be supported by adequate documentation in the form of time sheets.
- .11 Mobilization/Demobilization – Boom Trucks (Equipment Owned by Contractor): The mobilization and demobilization of a boom trucks will be paid by the kilometer from home base to work site and return for one "return trip" only. Mobilization and demobilization costs for additional trips off site will not be measured for payment.
- .12 There will be no measurement for payment made for Mobilization and/or Demobilization of Boom Trucks owned by others.
- .13 Boom Truck Rental Allowance – Contractor Owned: The supply of a Boom Truck owned by the Contractor, including operator, will be paid at the fair and reasonable industry rate as pre-approved by the Departmental Representative. There will be no Overhead and Profit Allowance for equipment owned by the Contractor. All quotes and/or costs must be pre-approved by the Departmental Representative prior to mobilization of equipment.
- .14 Boom Truck Rental Allowance – Owned by Others: The rental of a Boom Truck owned by others, including operator, will be paid at the fair industry rate according to the actual invoiced cost, plus an overhead and profit allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Boom Truck Rental Allowance principle to determine the total Boom Truck Rental Allowance Cost. The Contractor must make every effort to obtain the best price available for any boom truck rental. All quotes and/or costs must be pre-approved by the Departmental Representative prior to mobilization of equipment. All costs to be supported with adequate documentation.
- .15 Demolition and removal of all existing structural timber required to perform the work as specified is to be incidental to the above pay item.

- .16 Miscellaneous Disposal: All dumping fees will be paid to the Contractor at cost upon submission of receipt of payment from the authority having jurisdiction. This also includes any payment made for disposal of contaminated dredged materials at a confined disposal facility or appropriate contaminated soil disposal facility, as approved by the Departmental Representative. There will be an overhead and profit allowance (OH&P). When bidding this item the Contractor's allowance factor for overhead and profit will be entered in the space provided in the unit price table. This factor will then be multiplied by the Miscellaneous Disposal Allowance Principal to determine the total Miscellaneous Disposal Allowance Cost. All quotes and/or costs must be pre-approved by the Departmental Representative prior to transporting material to the dump site. All costs to be supported with adequate documentation.
- .17 Accommodations and meals at the individual identified project locations to be incidental to all of the above pay items.
- .18 Payment for all dimension timber will be made on volume calculated from nominal sizes as indicated on drawing and specified, i.e. 200 mm x 200 mm.

PART 2 - PRODUCTS

2.1 TIMBER MATERIALS

- .1 Timber: Use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.
- .2 Species
 - .1 Coping, pile caps, beams, wales, wale splice blocks, wale supports, cross-bracing, wheelguard and wheelguard blocks: Hemlock or Douglas Fir (CCA or ACA treated).
 - .2 Hardwood fenders, chocks, and ladder uprights: Birch or Maple (untreated).
- .3 Grade: No. 1 Structural Grade
- .4 Grading Authority: NLGA
- .5 Preservative Treatment: Treat to CAN/CSA O80-15 (Latest Edition), for coastal waters and Section 06 05 73 – Wood Treatment. Timbers will be treated in the lengths required. Unnecessary field cutting will not be permitted.
- .6 Primer: Alkyd undercoat, exterior oil wood primer. To be pre-approved by the Departmental Representative
- .7 Paint:
 - .1 Red: Alkyd/ Oil Resin marine paint. Bright red in colour. To be pre-approved by the Departmental Representative.
 - .2 Yellow: Safety Yellow Pittsburgh Alkyd/ Oil Resin marine paint. I.D 7-808.

2.2 MISCELLANEOUS STEEL AND FASTENINGS

- .1 Miscellaneous Steel: All steel and fastenings to be CSA-G40.20/G40.21-13 (Latest Edition), Grade 300 W, galvanized.
- .2 Nails and Spikes: to CSA B111 Wire Nails, Spikes and Staples or, ASTM F 1667-17 (Latest Edition) Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .3 Bolts and Nuts: to ASTM A307-14 (Latest Edition). All machine bolts and nuts to be galvanized.
- .4 Drift Bolts: to CSA-G40.20/G40.21-13 (Latest Edition) from round stock button head and diamond or wedge point. All drift bolts to be galvanized.
- .5 Washers:
 - .1 Round Plate Washers: for 16 mm machine bolts will be 76 mm diameter by 6.4 mm thick, for 19 mm machine bolts will be 79 mm diameter by 7.9 mm thick and have a hole diameter of 18 mm and 21 mm diameter respectively. Washers to conform to G40.21-13 (Latest Edition). All washers to be galvanized.
 - .2 Plain Washers: to CSA B19.1 (Latest Edition), Class 2. All washers to be galvanized.
 - .3 Square washers are not permitted.
- .6 Galvanizing: will conform to ASTM-A123/A123M-15 (Latest Edition), Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- .7 Ladder Rungs and Hand Grips: to CSA G40.21-13 (Latest Edition), galvanized.
- .8 Welding in accordance with CSA Standards. The welders will be qualified to the appropriate classification as stated in CSA W47.1-09 (Latest Edition) "Certification of Companies for Fusion Welding of Steel Structures." Conform welding to all appropriate requirements and recommendations of CSA W59-13 (Latest Edition) "Welded Steel Construction" (metal arc welding).

2.3 ANCHOR BOLTING SYSTEM

- .1 Anchor bolts, where required, for anchoring coping and/or wheelguard to existing concrete deck will be 19 mm diameter resin cartridge anchors unless otherwise specified by the Departmental Representative.
- .2 Submit shop drawings/ data sheets and manufacturer's specification for anchor bolts for approval.
- .3 Anchor bolts to be installed with strict adherence to manufacture Specifications.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Install structural timbers to details shown on drawings or as specified in the Standing Offer "Call-Ups."

3.2 COPING

- .1 Timber coping will range in size from 150 x 200 mm to 200 x 300 mm.
- .2 Secure coping to timber below with drift bolts and to concrete deck with machine bolts. The machine bolts will be countersunk on the exterior face; the nut installed on the outside and each bolt equipped with 2 washers. Size and spacing of hardware will be noted on the Standing Offer "Call-Up"
- .3 Secure coping to concrete deck using existing coping anchor bolts where approved by Departmental Representative. If existing anchor bolts are determined unusable, secure coping with resin cartridge anchor bolts. Size and spacing of anchor bolts will be noted in the Standing Offer "Call-Up". All bolts to be countersunk on the exterior face. All countersinking to be drilled.

3.3 PILE CAPS

- .1 Timber pile caps will range in size from 200 x 200 mm to 300 x 300 mm.
- .2 Pile caps are to be in one complete length for each row and fastened to timber posts with 19 mm diameter x 900 mm long drift bolt.

3.4 BEAMS

- .1 Beams to range in size 150 x 150 mm to 250 x 250 mm, spaced at 600 mm on centre.
- .2 Secure beams to every support crossed with drift bolts.
- .3 Beams will be of minimum length of 6700 mm, except where required as otherwise.
- .4 Block beams at ends if required.

3.5 WALES, WALE SPLICE BLOCKING, AND WALE SUPPORTS

- .1 Wales to range in size from 200 x 200 mm to 250 x 250 mm, spaced as required.
- .2 Wales to be in minimum lengths of 6100 mm except where required as otherwise.
- .3 Wales to be butt joined between pile bents. Wale splice blocks to be installed as noted in the Standing Offer "call-up". Wales to be attached to timber piles as noted in the Standing Offer "call-up". Contractor to provide necessary treated levelling shims to ensure straight wharf face. All machine bolts to be countersunk. All countersinking to be drilled.
- .4 Wale supports to extend from below deck elevation to LNT and attached to cribwork with four (4) machine bolts.

3.8 CROSS-BRACING

- .1 Cross-bracing will range in size from 100 mm x 150 mm to 100 mm x 200 mm and supplied in lengths specified.
- .2 Cross-bracing will be installed diagonal or horizontal on both sides of timber piles and span across at least three (3) piles.
- .3 Cross bracing to be attached to timber pile with machine bolts.

3.9 CRIBWORK TIMBER

- .1 Cribwork timbers, (i.e. crossties, longitudinals, or verticals) will range in size from 150 mm x 150 mm to 250 mm x 250 mm, but will typically be 200 mm x 200 mm.
- .2 Cribwork timbers will be in minimum length of 6100 mm except where required as otherwise.
- .3 Splices in cribwork timbers will be butt joined at the centre of a marrying splice block.
- .4 Cribwork timbers to be secured horizontally to verticals as required. Machine bolts to be countersunk above LNT at exterior face.

3.2 WHEELGUARD AND WHEELGUARD BLOCKING

- .1 Wheelguard timbers will range in size from 150 mm x 150 mm to 250 mm x 250 mm, but will typically be 200 mm x 200 mm.
- .2 Wheelguard timbers will be in minimum lengths of 6100 mm or as specifically required as otherwise, with butt joints made over wheelguard blocking.

- .3 Wheelguard timbers to be chamfered on top, 25 mm on each horizontal and vertical surface.
- .4 Wheelguard blocking will be installed at 1500 mm on centre as support for wheelguard.
- .5 Wheelguard will be secured through wheelguard blocking, coping and two (2) crib timbers below with two (2) drift bolts as required.
- .6 All wheelguard and wheelguard blocking will be primed and painted as required.

3.10 FENDERS – HORIZONTAL AND VERTICAL

- .1 Fenders will range in size from 100 mm x 150 mm to 250 mm x 250 mm.
- .2 Horizontal fenders will be in minimum lengths of 3600 mm or as specifically required as otherwise.
- .3 Vertical fenders will be in minimum lengths required to extend from underside of horizontal fender to 300 mm below LNT.
- .4 Top horizontal fenders to be chamfered 25 mm on top seaward face.
- .5 Top of vertical fenders to be bevelled at forty-five (45) degrees if not placed beneath horizontal fenders.
- .6 Do not notch or cut fenders to provide straight wharf face. Continuous blocking will be installed behind fenders to provide straight face.
- .7 Secure fenders to coping, beams, wales or cribwork timbers with drift bolts or lag screws as required.
- .8 All bolt heads and screw heads to be countersunk.
- .9 Exposed tops of all horizontal and vertical fenders to be primed and painted.

3.11 CHOCKS

- .1 Chocks will range in size from 100 mm x 150 mm to 150 mm x 250 mm.
- .2 Chocks to be of lengths to fit snugly between fenders.
- .3 Do notch or cut chocks to provide straight wharf face. Continuous blocking will be installed behind chocks to provide straight face.
- .4 Secure horizontal fender to coping, cribwork timbers or wales with drift bolts or lag screws as required. All bolt heads and screw heads to be countersunk.

3.12 LADDERS

- .1 Ladder uprights will range in size from 150 mm x 150 mm to 200 mm x 250 mm.
- .2 Ladder uprights will be in minimum lengths required to extend from top of wheelguard to 900 mm below LNT.
- .3 Top of ladder uprights to be bevelled at forty-five (45) degrees.
- .4 Do not notch or cut ladder uprights to provide straight wharf face. Continuous blocking will be installed behind ladders to provide straight face.
- .5 Secure ladder uprights to coping, beams, wales or cribwork timbers with drift bolts or lag screws as required.
- .6 All bolt heads and screw heads to be countersunk.
- .7 Ladder uprights to be primed and painted for entire length on all exposed faces.

3.13 PAINTING

- .1 Prime and paint four (4) sides and exposed ends of wheelguard, exposed sides of wheelguard blocking, and complete ladder uprights as directed by the Departmental Representative.
- .2 Use one (1) coat of exterior oil wood primer and a minimum two (2) coats of alkyd/ oil resin paint, Bright Red or Safety Yellow in color as required to match existing or as specified by Departmental Representative.
- .3 Paint materials for each coat to be product of a single manufacturer as specified. Ensure previous coat of primer or paint is dry before subsequent coat is applied.
- .4 If, for any reason, one coat of primer and two coats of paint does not satisfy the Departmental Representative, the Contractor will apply additional coat(s) at the Contractor's expense.

3.14 BOLT SIZING

- .1 Drift Bolts: Drift bolts used in the work will have a length equal to thickness of timbers being fastened less 50 mm unless otherwise specified. Holes for drift bolts will be bored 2 mm smaller diameter than size of steel used and for full length of bolts.
- .2 Machine Bolts: Machine bolts used in work will have a length equal to thickness of timbers being fastened plus thickness of washers plus 40 mm. Where bolts are countersunk, the length will be as above less depth of countersinking. Machine bolts will be threaded for 64 mm. Holes will be drilled same diameter as bolt.

- .3 Lag Screws: All lag screws used in the work will have a length equal to thickness of timbers being fastened less 50 mm and depth of countersinking. Holes for lag screws to be drilled same diameter as shank portion of screw and to inside thread diameter for threaded portion of screw and for full length. All lag screws will be countersunk, screwed, not driven in place, and will have one (1) standard washer under the head.
- .4 Countersink drift bolts and/or lag screws in hardwood fenders, chocks, and ladders to the extent that the minimum distance from face of timber to head of bolt is 12 mm.
- .5 Bolting of timbers without properly drilled bolt holes will not be accepted.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/ Demolition Waste Management and Disposal.

1.2 REFERENCES

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M 180-11 (Latest Edition), Corrugated Sheet Steel Beams for Highway Guiderrails.
- .2 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A 307-14 (Latest Edition), Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - .2 ASTM-A123/A123M-15 (Latest Edition), Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental Representative.
- .5 Fold up metal banding, flatten and place in designated area for recycling.
- .6 Do not dispose of preservative treated wood through incineration.
- .7 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .8 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.
- .9 Dispose of unused preservative material at an official hazardous material collections site. Do not dispose of unused preservative material into the sewer system, streams, lakes, on ground or in any other location where they will pose a health or environmental hazard.

1.4 MEASUREMENT FOR PAYMENT

- .1 W-Beam Guiderail: Will be measured by the linear meter (LM) calculated from actual field measurements, as measured from outer tips of steel W-beam guide rail, including terminal sections and buried end sections. Contractor to provide all materials, hardware, labour, plant and equipment required to install guiderail.
- .2 Guiderail Posts: Will be measured by the unit (Each) calculated from actual field count. Contractor to provide all materials, hardware, labour, plant and equipment required to install guiderail posts.
- .3 Offset Blocks: Will be measured by the unit (Each) calculated from actual field count. Contractor to provide all materials, hardware, labour, plant and equipment required to install guiderail offset blocks.
- .4 An estimate of anticipated demolition and/ or removal costs must be provided for review and approval prior to starting any work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel W-beam guide rail as indicated and to following requirements:
 - .1 Steel rail and terminal sections: to AASHTO M180 (Latest Edition), Class B (3.5 mm thickness or 10 gauge), Type 2 zinc coated (3.6 oz/ ft²)
 - .2 Bolts, nuts and washers: to ASTM A307, hot dip galvanized to CSA G164 (Latest Edition). or ASTM A123/A123M (Latest Edition) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 Organic zinc-rich coating: to CAN/CGSB-1.181 (Latest Edition).
- .3 Timber guiderail posts and offset blocks:
 - .1 Species: Hemlock or Douglas Fir (CCA or ACA treated).
 - .2 Type: Pressure treated in accordance with CAN/CSA-O80 Series.
 - .3 Grade: No. 1 Structural Grade.
 - .4 Dimensions:
 - .1 Guiderail Posts: 200 x 200 x 2500 mm.
 - .2 Offset Blocks: 200 x 200 x 350 mm

PART 3 - EXECUTION

3.1 ERECTION

- .1 Set posts by instrument for alignment in locations as designated by the Departmental Representative.
- .2 Excavate post holes to depths as indicated and to diameter of 360 mm plus or minus 20 mm. Compact bottom to provide firm foundation. Set post plumb and square in hole.
- .3 Backfill around posts using excavated material and compact in uniform layers not exceeding 150 mm compacted thickness.
- .4 Install offset blocks if required.
- .5 Cut off tops of posts as indicated, with tops sloped and parallel to grade of pavement edge.
- .6 Treat cut tops.
- .7 Erect steel W-beam components to details as required.
- .8 Lap joints guiderail in direction of traffic.
- .9 Tighten nuts to 100 N.m torque.
- .10 Maximum protrusion of bolt 12 mm beyond nut.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies the requirements for supply and installation of mooring devices as follows:
 - .1 Supply and installation of Type "B1" mooring cleats.
 - .2 Supply and installation of mooring rings.

1.2 MEASUREMENT FOR PAYMENT

- .1 Mooring Cleats - Type "B1": The supply and installation of Type "B1" mooring cleats, including reinforced concrete pedestal, will be measured by the unit (Each) secured in place. Contractor to provide all concrete, reinforcing steel, anchor bolts, chemical anchors, nuts, washers, grout, fastenings, paint, plant, equipment and labour.
- .2 Mooring Rings: The supply and installation of mooring rings, including all material, plant, equipment and labour will be measured by the unit (Each) secured in place.
- .3 Include incidental to the unit price any costs for demolition and removal required to carry out the work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Mooring Devices:
 - .1 Mooring Cleats Type "B1": galvanized cast iron cleats, 36.2 kg weight.
 - .2 Mooring Rings and Fittings: mild steel galvanized.
 - .3 Anchor Bolts and Nuts: to ASTM A307 (Latest Edition), galvanized.
 - .4 Non-Shrink Grout: pre-mixed compound of non-metallic aggregate and plasticizing agents, capable of developing min. compressive strength of 50 MPa at 28 days.
 - .5 Galvanizing: to CSA G164 (Latest Edition), minimum zinc coating 610 g/m².
 - .6 Welding: to CSA W59 (Latest Edition).
 - .7 Sealer: to Section 07 92 10.
 - .8 Concrete: to Section 03 30 00.
 - .9 Concrete Reinforcement: to CSA G30.12M, Grade 400 (Latest Edition).
 - .10 Primer: Alkyd undercoat, exterior oil ferrous metal primer, similar to Pittsburgh 6-208.
 - .11 Paint: Alkyd/Oil Resin paint similar to Pittsburgh Paints "Brilliant Red (Safety Red)" Product ID 7-801. Paint to conform to CAN/CGSB-1.61-2004 (Latest Edition).

2.2 SHOP DRAWINGS

- .1 Submit fabricator's shop drawings, if required, on cleats in accordance with Section 01 33 00 - Submittal Procedures.

PART 3 – EXECUTION

3.1 INSTALLATION

- .1 Mooring Cleats - Type "B1":
 - .1 Install appropriate mooring cleat block, pedestal and Type "B1" cleats as indicated in the Standing Offer "Call-Up".
 - .2 After cleat installation is complete, bolt holes in cleats to be filled with approved filler/ waterproofing compound.
- .2 Mooring Rings:
 - .1 Install Mooring Rings as indicated in the Standing Offer "Call-Up".

3.2 GROUT

- .1 Set all mooring cleats at locations and elevations indicated or as directed by the Departmental Representative. Grout under base of cleat using a non-shrink, non-metallic type of grout after tightening of anchor bolts or positioning wedges. Grout must be approved by Departmental Representative. Fill anchor bolt holes with approved sealer. Ensure that temperatures of foundation, air, base and grout are within range specified by grout manufacturers.
- .2 Do not grout until approval given by Departmental Representative.

3.3 PAINTING

- .1 Paint ferrous metal portion of mooring cleat.
- .2 Use one (1) coat of exterior oil ferrous metal primer and two (2) coats of alkyd/oil resin paint as specified. Paint materials for each coat to be product of a single manufacturer as specified. Ensure previous coat of primer or paint is dry before second coat is applied.

END OF SECTION