
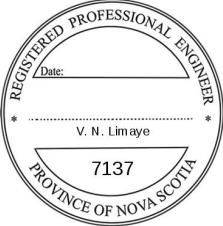


Fisheries and Oceans Canada
Small Crafts Harbours

PROJECT SPECIFICATIONS

**New Haven Wharf Repair,
New Haven
Victoria County, NS
Project No. C2-00707**

Issued for Tender	V.L.	Oct 31, 2023
Issued for 90% Review	V.L.	Sep. 22, 2023
Issued for 50% Review	V.L.	Aug. 11, 2023
Issue or Revision	Issued By	Date
		

This document is the document referred to as "Plans and Specifications" and marked "A" in the Articles of Agreement and includes the following:

"A"

Fisheries and Oceans Canada
Small Craft Harbours
New Haven Wharf Repair, New Haven
Victoria County, NS
Project No. C2-00707

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END OF SECTION

This document is the document referred to as "Plans and Specifications" and marked "A" in the Articles of Agreement and includes the following:

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Fisheries and Oceans Canada
Small Craft Harbours
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Drawing No. Title

M0	Cover Sheet
M1 of 2	Site Plan and Repair Details
M2 of 2	Plan and Details Wharf 401
M3 of 3	New Haven Wharf - M3 - Sections and Details

END OF SECTION

Part 1 GENERAL

1.1 Documents Required

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Reviewed shop drawings / submissions
 - .5 Change Orders
 - .6 Other modifications to Contract
 - .7 Field test reports
 - .8 Copy of approved work schedule
 - .9 Approved Project Specific Health and Safety Plan (As per section 01 35 24, 01 35 25 & 01 35 29)
 - .10 Approve Project Specific Environmental Plan (As per section 01 35 44)
 - .11 Approved Project Specific Execution Plan
 - .12 Approved Project Specific Quality Control Plan (As per section 01 45 00)
 - .13 Approved Detail Method Statement showing step by step repair procedure.
 - .14 Manufacturer's installation and application instructions.

1.2 Site Conditions

- .1 Records of existing structures and geotechnical reports may be available for inspection at the offices of:
Department of Fisheries and Oceans Canada
Sydney Area Office
1270 Westmount Road
Sydney, NS B1R 0A4
- .2 This material is not necessarily up-to-date and is for information purposes only. It should be complemented with site visits and consultation with appropriate expertise. The bidder shall contact the leasing officer 48 hours prior to allow time for PSPC to compile required information.

1.3 Work Schedule and Completion Dates

- .1 Prepare and submit to the *Departmental Representative* with five (5) business days of notification of Contract award, one (1) copy of the construction schedule, in the form of a bar chart, showing the dates for commencement and completion of each major activity of the work, including the work of subcontractors; dates of submissions, review and return of all drawings, etc.; the dates of Substantial Completion; and intended man hours of labour and equipment for each major items of work. If the schedule as submitted is unacceptable in any way, submit without delay a revised schedule satisfactory to the *Departmental Representative*.
 - .2 The *Departmental Representative* is to notify the Contractor in writing of acceptance of the Construction Schedule. Construction schedule dates shall meet all the time. If for any reason the Construction Schedule is not followed, immediately notify the *Departmental Representative* of the changes and submit a revised
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schedule for acceptance. Upon written acceptance by the *Departmental Representative*, this schedule will become the Construction Schedule.

- .3 Whenever required, give further written particulars concerning this schedule. The submission to and acceptance by the *Departmental Representative* of the Contractor's Construction Schedule or the furnishing of details and particulars thereto will not relieve the Contractor of any duties and responsibilities under the Contract.
- .4 At the end of each phase, all construction materials and equipment must be removed from the wharf areas to the satisfaction of the *Departmental Representative*.

1.4 Measurement Responsibilities

- .1 Notify *Departmental Representative* sufficiently in advance of operations to permit required measurements for payment purposes.

1.5 Contractor's Use of Site

- .1 Cooperate with Harbour Authority and users of existing facilities. All work taking place will be coordinated and agreed to so that there will be minimal impact to the daily ongoing activities of the harbour.
- .2 Should interferences occur, take directions from *Departmental Representative*.
- .3 Do not unreasonably encumber site with materials or equipment.
- .4 Move stored products or equipment which interfere with operations of *Departmental Representative* or other Contractors.
- .5 Obtain and pay for use of additional storage or work areas needed for operations.
- .6 Comply with all regulations and authorities having jurisdiction over the work, whether on land or on water.
- .7 Ensure no damage occurs to existing structures as a result of operations. Any said damage will be repaired at Contractor's expense.
- .8 Provide temporary barriers and warning signs in location where work is adjacent to areas used by public.

1.6 Codes and Standards

- .1 Perform work in accordance with National Building Code of Canada (NBC) 2020 and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements will apply.
- .2 Meet or exceed requirements of specified standards, codes and referenced documents. When a standard or code is outdated, the latest edition will supersede the referenced date.
- .3 Observe and enforce construction safety measures by Canadian Construction Safety Code and Construction Safety Code of Nova Scotia. In the event of conflict between any provisions of above authorities the most stringent provision will apply.
- .4 National Fire Code (NFC) of Canada 2020.

1.7 Project Meetings

- .1 Except for the initial kick-off meeting, schedule and administer project meetings, held on a minimum bi-weekly basis, for entire duration of work and more often when directed by *Departmental Representative* as deemed necessary due to progress of work or situation. Record minutes for distribution.

- .2 All project meetings will take place on site of work unless otherwise directed by the *Departmental Representative*.
- .3 The Contractor's superintendent and sub-contractors are to be present at all project meetings.

1.8 Setting Out of Work

- .1 Do all detail surveys necessary for the work, including locating and maintaining working points, and establishing lines and elevations. Perform all layout work, and carefully preserve benchmarks, reference points and stakes.
- .2 Provide such masts, scaffolds, batter boards, lines, straight edges, templates and other devices as may be necessary to facilitate layout, construction and inspection of the work. Whenever necessary, suspend work for such reasonable time as may be necessary to permit the *Departmental Representative* to check or inspect any portion of the Work. The Contractor will not be allowed any extra compensation or time for completion because of this suspension of work.
- .3 Elevations for the various grades and features of the specified works to be referenced and properly related to a benchmark, which will be approved by the *Departmental Representative*.
- .4 Verify all grades, lines, levels, and dimensions shown on the drawings and report any errors or inconsistencies to the *Departmental Representative* before commencing work. Provide and maintain well-built batter boards at all points to facilitate the progress of the work. Establish all other grades, lines, levels required to facilitate the work.

1.9 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 pedestrian, vehicular traffic, and services.
- .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 acceptance from *Departmental Representative* for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise *Departmental Representative* and confirm findings in writing.

1.10 Contract Documents

- .1 Contract Drawings:
 - .1 The drawings for the Work consist of all drawings listed in these "Plans and Specifications" marked "A" and any additional drawings issued at a later date by the *Departmental Representative*.
 - .2 *Departmental Representative* may furnish additional drawings to assist in proper execution of work. These drawings will be issued for clarification only. Such drawings will have same meaning and intent as if they were included with plans referred to in Contract Documents.
 - .3 The drawings indicate the extent and general dimensions of the work. Make all necessary measurements to ensure that the result of the work is in accordance with the intent.
 - .4 Verify all existing conditions in field prior to proceeding with work.
- .2 Contract Specifications:

- .1 The general requirements and technical specifications are written solely for the General Contractor. They are organized into the NMS format of separate divisions and sections.
- .2 Specification language is of the 'Short Form type' for example, where the word "provide" occurs, interpret it to mean "the Contractor shall furnish all labour, material and equipment necessary to complete the work".
- .3 This Specification and accompanying drawings are intended to describe and provide for a finished project. They are intended to be complementary, and what is called for by either will be as binding as if called for by both. The Contractor shall understand that the work herein described will be complete in every detail, notwithstanding that every item necessarily involved is not particularly mentioned, and Contractor will be held to provide all labour, materials and equipment necessary for the entire completion of the work and will not avail himself of any errors or omissions.

1.11 Permits and Regulations

- .1 Apply for, obtain and pay for all necessary permits, approvals and other authorizations required for the work.
- .2 Comply with all by-laws, ordinances and regulations of all authorities having jurisdiction.
- .3 Pay for any Municipal permits, per General Conditions as stated in the contract.

1.12 Cutting, Fitting and Patching

- .1 Execute cutting (including excavation), fitting and patching required to make work fit properly.
- .2 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .4 Obtain *Departmental Representative's* approval before cutting, boring or sleeving, or excavating adjacent to load-bearing members.

1.13 Record of Construction

- .1 As work progresses, maintain accurate records to show all deviations from the contract drawings, with particular reference to work which will be concealed. Prior to the inspection of the work for the issuance of the Final Certificate of Completion, provide the *Departmental Representative* with one set of white prints of the drawings with all deviations shown neatly thereon.
- .2 Provide "as built" cross sections of any excavation, dredging or fill work.

1.14 Payment

- .1 Payment for all work under this contract to be according to the Contract.
- .2 No separate payment will be made for work specified under General Conditions, Supplementary Conditions or any sections of Specification under Division 01. The cost of this work is to be considered as overhead and to be included in the unit prices of the Contract.
- .3 Dimensional changes as directed by the *Departmental Representative* to suit existing conditions, but not resulting in additional work or materials, will not be considered as extra to the Contract.

1.15 Site Examination

- .1 All parties tendering should visit the site of the work prior to submission of tenders and make themselves thoroughly acquainted with site conditions, conditions of existing objects to be removed, tides, degree of exposure and all information necessary for the proper carrying out of the work covered by the drawings and this Specification. Submission of Tender will be deemed that Contractor is conversant with site conditions.
- .2 The *Departmental Representative* will give no consideration whatsoever to any claim by the Contractor resulting from failure to have made all the necessary investigations prior to tendering.

1.16 Cooperation & Assistance to *Departmental Representative*

- .1 Co-operate with *Departmental Representative* on inspection of work.
- .2 Provide assistance when requested.
- .3 Provide small motorboat with operator and sounding chain for *Departmental Representative's* use when requested.

1.17 Datum

- .1 Datum referred to in this Specification is Chart Datum. Chart Datum is, by International Agreement a plane below which the tide will seldom fall. The Canadian Hydrographic Service has adopted the plane of the lowest normal tide (L.N.T.) as Chart Datum. As the rise, fall, and range of tides varies daily, the Canadian Tide and Current Tables, as issued by the Canadian Hydrographic Service, should be consulted for tidal predictions and other tidal information relating to the work.

1.18 Contractor's Representative

- .1 Continuously maintain on the site an authorized representative to whom communication may be addressed and who will be competent to speak for the Contractor in discussing work methods.

1.19 Workers Compensation

- .1 Contractor and all sub-contractors must be registered under the Workers Compensation Act and provide evidence of good standing.
- .2 At completion of Contract and before final payment is made, the Contractor will present to the *Departmental Representative* a Letter of Certification from the Workers Compensation Board, showing that all required assessments are paid in connection with all trades.

1.20 Laws, Standards Taxes and Fees

- .1 Comply with all laws and standards governing all or any part of the work, pay all applicable taxes and pay for all permits and certificates required in respect of the execution of the work. Where variances exist between the requirements of agencies governing all or any part of the work, the most restrictive will govern, but in no instance will the standards established by the drawings and this Specification, which exceed such requirements, be reduced.

1.21 Protection and Repair

- .1 Repair any damage resulting from operations under this contract.
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1.22 Location of Equipment and Fixtures

- .1 Location of equipment, fixtures or any appurtenances indicated are to be considered approximate.

1.23 Inspection and Testing

- .1 The *Departmental Representative* may employ an Inspector and/or Testing Company to ensure work conforms with contract.

1.24 Disposal of Debris

- .1 Debris, including construction materials not incorporated in the work, oil products and containers, and other materials of this nature will be disposed of in suitable locations off the site. This includes costs of disposing of contaminated materials such as creosote treated timber. Disposal is the responsibility of the Contractor.
- .2 Material from the work will not be permitted to go adrift or otherwise become a menace to navigation.

1.25 Existing Soils Conditions

- .1 Any information pertaining to soils and all borehole logs are furnished by the *Departmental Representative* as a matter of general information only and borehole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the boreholes themselves.

1.26 Relics And Antiquities

- .1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of work.
- .2 Give immediate notice to *Departmental Representative* and await written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain her Majesty's property.

1.27 Temporary Navigational Buoys

- .1 The Contractor is to maintain temporary buoys to mark the position of the outer end of the structure as construction proceeds. All buoys are to meet the requirements of Canadian Coast Guard Standard TP968 and be equipped with radar reflectors.
- .2 During Construction, the wharf removal/construction area shall be marked with a yellow cautionary buoy, to be placed no more than 10 meters from the seaward end of the construction area in order to identify the location of the construction project.
- .3 The Contractor shall coordinate the buoy installation with the local harbour authority.
- .4 The Contractor is responsible for all costs associated with the supply, installation and removal of all temporary navigational buoys.

END OF SECTION

Part 1 GENERAL

1.1 Submittals

- .1 Upon award of contract and prior to commencement of work, submit to *Departmental Representative* the following work management documents:
 - .1 Work Schedule as specified herein.
 - .2 Shop Drawing Submittal Schedule specified in section 01 33 00.
 - .3 Health and Safety Plan specified in section 01 35 29.

1.2 Work Schedule

- .1 The contractor will coordinate his work with the Harbour Authority's directives.
 - .2 Upon acceptance of bid submit:
 - .1 Detailed work schedule within 5 business days of contract award.
 - .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
 - .3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
 - .3 Work schedule content to include as a minimum the following:
 - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones.
 - .4 Work schedule must take into consideration and reflect the work phasing, and operational restrictions as indicated on drawings.
 - .5 Schedule work in cooperation with the *Departmental Representative*. Incorporate within Work Schedule, items identified by *Departmental Representative* during review of schedule.
 - .6 Completed schedule shall be approved by *Departmental Representative*. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without *Departmental Representative's* approval.
 - .7 Ensure that all sub trades and subcontractors are made aware of the work restraints and operational restrictions specified.
 - .8 Schedule Updates:
 - .1 Submit on a weekly basis or as otherwise directed by *Departmental Representative*.
 - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
 - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
 - .9 *Departmental Representative* will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by *Departmental Representative*. Address and take
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corrective measures on items identified by reviews and as directed by *Departmental Representative*. Update schedule accordingly.

- .10 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the *Departmental Representative*.

1.3 Operational Restrictions

- .1 The Contractor must recognize that harbour activities and occupants will be affected by implementation of this Contract. The Contractor must perform the work with utmost regard to the safety and convenience of all harbour users. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the harbour without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.
- .2 Facility circulation maintained:
 - .1 Ensure that entrances, roadways, loading zones and other circulation routes are maintained free and clear providing safe and uninterrupted passage for Facility users and public at all times during the entire Work.

1.4 Project Meetings

- .1 Except for the initial kick-off meeting, schedule and administer project meetings, held on a minimum bi-weekly basis, for entire duration of work and more often when directed by *Departmental Representative* as deemed necessary due to progress of work or particular situation. Record minutes for distribution.
- .2 All project meetings will take place on site of work unless otherwise directed by the *Departmental Representative*.
- .3 The Contractor's superintendent and sub-contractors are to be present at all project meetings.

1.5 Work Coordination

- .1 The General Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
 - .1 Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
- .2 Work Cooperation:
 - .1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
 - .2 Ensure that each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.
- .3 No extra costs to the Contract will be considered by the *Departmental Representative* due to Contractor's failure to effectively coordinate all portions of the Work. Disputes among various trades in absence of proper communication about the areas and extent of interface work shall be the sole responsibility of the General Contractor and to be resolved at contractor's cost.

1.6 Other Contracts

- .1 Further contracts may be let during the period that this Contract is in progress.

- .2 Cooperate with other Contractors in carrying out their respective work and carry out all instructions from the *Departmental Representative* in this regard.
- .3 Connect properly and coordinate work with that of other Contractors.

END OF SECTION

Part 1 PROJECT PARTICULARS

1.1 Description of Work

- .1 The work under this contract involves the stabilization of structures 401 and 402 and removal and disposal of structure 403 located at New Haven, Victoria County, Nova Scotia.
- .2 The general work requirements for this project includes but is not limited to:
 - .1 Mobilization and Demobilization
 - .2 Required submission of various plans like Environmental Mitigation Plan, Project Execution Plan, Project HSE Plan, Project Quality Plan, Project Schedule and its implementation(s).
 - .3 Submission of a Health and Safety Plan, including provision for Covid-19 protection and its implementation (s).
 - .4 Submission of a demolition plan mentioning removal of existing structure and disposal of various material.
 - .5 Submission of list of equipment for the project with capacity and anticipated date of equipment mobilization on site. All the equipment shall meet the requirement mentioned in section 01 61 00.
 - .6 Submission of all shop drawings/submittals indicated within the specifications.
 - .7 Submission of red line as-built drawings at the end of project.
 - .8 Restore any damaged area to the construction zone to its original state or better.
 - .9 Cleaning.
- .3 All submitted plans have to have the approval of the Department Representative before the commencement of the work or phase of work.

Part 2 PROJECT MEASUREMENT

2.1 General

- .1 This section details the measurement method to be used for payment purposes. Incidental items covered in the various sections of the Specification are to be allowed for in the pricing of each pay item.
- .2 The contractor will be requested to provide a breakdown of the lump sum items for payment purposes following award of the contract.

2.2 Measurement For Payment

.1 Lump Sum Items (Accumulated Total)

Note: All items designated as lump sum are to be combined into one accumulated lump sum total in the tender documents.

Division 01

.1 Mobilization and Demobilization:

All work associated with the mobilization and demobilization of all equipment required to perform and complete the work as outlined in the Contract Drawings, shall be measured for payment by the lump sum. This item shall include any costs associated with the removal / storage of equipment at the end of each construction phase to accommodate the seasonal fishing season.

.2 Environment Controls: (Section 01 35 44)

All environment controls required to complete the work shall be measured for payment by the lump sum.

.3 Security control, fencing, signs, access control and site security when contractor is off site

Division 31

.3 Site Work, Demolition and Removals: (Section 31 11 00)

All sitework, demolition, removals and disposals required to complete the work shall be measured for payment by the lump sum. Any additional demolition and removals essential to complete the work will be considered incidental to this demolition item.

.2 Unit Price Items

Note: The following outlines the unit of measurement of the unit price items as indicated in the tender documents.

Division 03

.1 Concrete Curb Repair: (Section 03 30 00)

Unit of Measurement: Linear Meter (m)

Method of Measurement: Joint measurement from the site before repair.

Supply and placement of miscellaneous cast-in-place concrete for curb repair shall be measured for payment by the linear meter (m). Chipping of old concrete surface, reinforcement steel, bonding agent, soaking of concrete surface prior to repair, formwork, chamfers, chemical anchored steel reinforcement and all supplementary materials shall not be measured for payment but considered incidental to the work.

.2 Tremie Concrete: (Section 03 37 26)

Unit of Measurement: Square Meter (m²)

Method of Measurement: Dimensions shown on the contract drawings.

Supply and placement of underwater tremie concrete of the wall, shall be measured for payment by the cubic meter (m³). Steel reinforcing, formwork, inserts and all supplementary materials will not be measured for payment but considered incidental to the work. Joint sealant at the interface shall be considered incidental to this item.

Division 06

.3 Timber Sheathing: (Section 06 05 73)

Unit of Measurement: Cubic Meter (m³)

Method of Measurement: Dimensions shown on the contract drawings.

Supply and installation of timber sheathing shall be measured for payment by the cubic meter (m³) successfully installed. Bolts and hardware shall not be measured but considered incidental to the work.

.4 Timber Fender: (Section 06 05 73)

Unit of Measurement: Cubic Meter (m³)

Method of Measurement: Dimensions shown on the contract drawings.

Supply and installation of timber fender shall be measured for payment by the cubic meter (m³) successfully installed. Bolts and hardware shall not be measured but considered incidental to the work.

Division 35

.5 Ladders: (Section 35 70 00)

Unit of Measurement: Each (Ea.)

Method of Measurement: As shown on the contract drawings.

Supply and installation of treated timber ladders, including holdfasts and extensions, rungs and fastenings, shall be measured for payment per each (Ea.). Bolts and hardware shall not be measured but considered incidental to the work. 150 mm x 150 mm timber wales at ladder locations shall be considered incidental to this item.

.6 Mooring Cleats: (Section 35 70 00)

Unit of Measurement: Each (Ea.)

Method of Measurement: As shown on the contract drawings.

Supply and installation of mooring cleats shall be measured for payment per each (Ea.). Bolts and hardware, surface preparation and galvanized shall not be measured, but considered incidental to the work.

.7 Reinstatement of Mooring Cleats: (Section 35 70 00)

Unit of Measurement: Each (Ea.)

Method of Measurement: As shown on the contract drawings.

Reinstatement of mooring cleats shall be measured for payment per each (Ea.). Bolts and hardware, surface preparation and galvanized shall not be measured, but considered incidental to the work. No separate payment shall be made for removal as that is included in lumpsum.

END OF SECTION

Part 1 GENERAL

1.1 General

- .1 Submit to *Departmental Representative*, for review, shop drawings, product data, samples and other information specified.
- .2 Until submission is reviewed, work involving relevant product may not proceed.

1.2 Shop Drawings

- .1 Drawings to be originals prepared by contractor, subcontractor, supplier or distributor, which illustrate appropriate portion of work, showing fabrication, layout, setting or erection details as specified in appropriate sections.
- .2 Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- .3 Maximum sheet size 860 mm X 1120 mm.

1.3 Product Data

- .1 Certain specification sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance chart, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

1.4 Samples

- .1 Submit samples in sizes and quantities specified.
- .2 Construct field samples and mock-ups at locations acceptable to *Departmental Representative*.
- .3 Accepted samples will become standards of workmanship and material against which, installed work will be checked on project.

1.5 Miscellaneous Data

- .1 Provide certificates, methodologies, design and test results as required.

1.6 Coordination of Submissions

- .1 Review shop drawings, product data, samples and miscellaneous data prior to submissions.
 - .2 Verify:
 - .1 Field Measurements.
 - .2 Field Construction Criteria.
 - .3 Catalogue numbers and similar data.
 - .3 Coordinate each submission with requirements of work and contract documents. Individual submissions will not be reviewed until all related information is available.
 - .4 Contractor's responsibility for errors and omissions in submission is not relieved by the *Departmental Representative's* review of submissions.
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- .5 Contractor's responsibility for deviations in submission from requirements in Contract documents is not relieved by *Departmental Representative's* review of submission unless *Departmental Representative* gives written acceptance of specified deviations.
- .6 Notify the *Departmental Representative*, in writing at time of submission, of deviations from requirements of contract documents stating reasons for deviations.
- .7 After *Departmental Representative's* review, distribute copies.

1.7 Submission Requirements

- .1 Schedule submissions at least 14 days before dates reviewed submissions will be needed.
- .2 Submit requested number of copies of shop drawings, product data which Contractor requires for distribution, plus two (2) copies which will be retained by *Departmental Representative*.
- .3 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample submitted.
 - .5 Other pertinent data.
- .4 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Contractor.
 - .2 Subcontractor.
 - .3 Supplier.
 - .4 Manufacturer.
 - .5 Separate details when pertinent.
 - .4 Identification of product or material.
 - .5 Relation to adjacent structure or materials.
 - .6 Field dimensions clearly identified as such.
 - .7 Specification Section Number.
 - .8 Applicable standards such as CSA or CGSB numbers.
 - .9 Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with contract documents.

1.8 Shop Drawings Review

- .1 The review of shop drawings by Public Services and Procurement Canada or its authorized consultant, is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that Public Services and Procurement Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the

foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

1.9 Other Reviews

- .1 As for shop drawings above, other reviews are for the sole purpose of ascertaining the general concept.

END OF SECTION

Part 1 GENERAL

1.1 Section Includes

- .1 Fire Safety Requirements.
- .2 Hot Work Permit.
- .3 Existing Fire Protection and Alarm Systems.

1.2 Related Sections

- .1 Section 01 35 29 – Health and Safety.

1.3 References

- .1 National Fire Code 2020.
- .2 National Building Code 2020.
- .3 CAN/CSA-W117.2, "Safety in Welding, Cutting and Allied Processes."
- .4 Applicable OHS legislation.

1.4 Definitions

- .1 Hot Work - Applies to hot works involving open flames or producing heat or sparks, including, without being limited to, cutting, welding, soldering, brazing, grinding, adhesive bonding, thermal spraying and thawing pipes.

1.5 Submittals

- .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to *Departmental Representative* for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with Section 01 33 00 – Submissions and Shop Drawings.

1.6 Fire Safety Requirement

- .1 Implement and follow fire safety measures during Work. Comply with following:
 - .1 National Fire Code 2020.
 - .2 National Building Code 2020.
 - .3 Provincial OHS Acts and Regulations.
 - .4 CAN/CSA-W117.2, "Safety in Welding, Cutting and Allied Processes."
- .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.
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- .2 To obtain authorization, submit to *Departmental Representative* for review:
 - .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 and followed during performance of hot work, *Departmental Representative* will give 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.
- .4 Requirement for individual authorization will be 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 the Facility. Follow *Departmental Representative's* directives in this regard.
- .7 Hot works shall be performed only by personnel trained in the safe use of equipment in conformance with this Section.

1.8 Hot Work Equipment

- .1 Maintenance
 - .1 Hot work equipment shall be maintained in good operating condition.
- .2 Inspection
 - .1 Hot work equipment shall be examined for leakage or defects prior to each use.
 - .2 Leaks or defects found in hot work equipment shall be repaired prior to use.
- .3 Equipment Not in Use
 - .1 All valves shall be closed, and gas lines bled when Class 2 gas hot work equipment is not in use.
 - .2 Electric hot work equipment shall be de-energized when not in use.
- .4 Compressed Gas Equipment
 - .1 The design and installation of oxygen-fuel gas equipment shall conform to NFPA 51, "Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes."
 - .2 Unalloyed copper piping shall not be used for acetylene gas.
 - .3 Oil or grease shall not be used with equipment for oxygen.

.4 Cylinders of Class 2 gases shall conform to Part 3.

1.9 Prevention of Fires

.1 Location of Operations

.1 Except as provided in Sentence (2), hot work shall be carried out in an area free of combustible and flammable contents, with walls, ceilings and floors of non-combustible construction or lined with non-combustible materials.

.2 When it is not practicable to undertake hot work in an area described in Sentence (1),

.1 Combustible and flammable materials within a 15m distance from the hot work shall be protected against ignition in conformance with Article 4 below.

.2 A fire watch shall be provided during the hot work and for a period of not less than 60 min after its completion.

.3 A final inspection of the hot work area shall be conducted 4 hours after completion of work.

.3 When there is a possibility of sparks leaking onto combustible materials in areas adjacent to the area where hot work is carried out,

.1 Openings in walls, floors or ceilings shall be covered or closed to prevent the passage of sparks to such adjacent areas, or

.2 Sentence (2) shall apply to such adjacent areas.

.4 Protection of Combustible and Flammable Materials

.1 Any combustible and flammable material, dust or residue shall be:

.1 Removed from the area where hot work is carried out, or

.2 Protected against ignition by the use of non-combustible materials.

.3 Combustible materials or building surfaces that cannot be removed or protected against ignition as required in Sentence (1) shall be thoroughly wetted where hot work is carried out. Any process or activity that produces flammable gases or vapours, combustible dusts or combustible fibres in quantities sufficient to create a fire or explosion hazard shall be interrupted and the hazardous conditions shall be removed before any hot work is carried out.

1.10 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 with individually issued permit by Contractor's Superintendent to worker or subcontractor granting permission to proceed with Hot Work.

.3 Permit required for each Hot Work event.

.4 Designation of a competent person on site as a Fire Safety Watcher responsible to conduct a fire safety watch for a minimum duration of 60 minutes immediately following the completion of the Hot Work.

- .5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
- .6 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. Label document as being the Hot Work Procedures for this contract.
- .4 Procedures shall clearly establish responsibilities of:
 - .1 Worker performing hot work,
 - .2 Person issuing the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractor(s) and Contractor.
- .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.

1.11 Hot Work Permit

- .1 Hot Work Permit to include the following:
 - .1 Project name and project number;
 - .2 Building name and specific room or area where hot work will be performed;
 - .3 Date of issue;
 - .4 Description of hot work type needed;
 - .5 Special precautions to be followed, including type of fire extinguisher needed;
 - .6 Name and signature of permit issuer.
 - .7 Name of worker to which the permit is issued.
 - .8 Permit validity period not to exceed 8 hours. Indicate start time/date and termination time/date.
 - .9 Worker's signature with time/date of hot work completion.
 - .10 Stipulated time period of safety watch.
 - .11 Fire Safety Watcher's signature with time/date.
- .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, signed and returned to Contractor's Superintendent for safe keeping on site.

1.12 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, 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.

1.13 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.

END OF SECTION

Part 1 GENERAL

1.1 Section Includes

- .1 Procedures to isolate and lockout electrical facility or other equipment from energy source.

1.2 Related Work

- .1 Section 01 35 29 – Health and Safety.

1.3 References

- .1 CSA C22.1- 15, Canadian Electrical Code,
- .2 CSA-C22.3 No.1-06, Overhead Systems.
- .3 CSA C22.3 No.7-06, Underground Systems.
- .4 COSH, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

1.4 Definitions

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.
- .3 De-energize in the electrical sense, that a piece of equipment is isolated and grounded, e.g., if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
- .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.5 Compliance Requirements

- .1 Comply with the following in regard to isolation and lockout of electrical facilities and equipment:
 - .1 Canadian Electrical Code 2015.
 - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations.
 - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
 - .4 Procedures specified herein.
 - .5 CSA Z 460-13 (R2018) Control of Hazardous Energy – Lock out and other methods.

.6 CSA Z 462-18 Workplace Electrical Safety.

.2 In event of conflict between any provisions noted above, the most stringent provision will apply.

1.6 Submittals

.1 Submit copy of lockout procedures, sample of lockout permit and lockout tags proposed for use in accordance with Section 01 33 00. Submit within 14 calendar days of acceptance of bid.

1.7 Isolation of Existing Services

.1 Obtain *Departmental Representative's* written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.

.2 To obtain authorization, submit to *Departmental Representative* following documentation:

.1 Written Request for Isolation of the service or facility and

.2 Copy of Contractor's Lockout Procedures.

.3 Make a request for Isolation for each event, unless directed otherwise by *Departmental Representative*, and as follows:

.1 Fill-out standard forms in current use at the Facility when so directed by *Departmental Representative* or

.2 Where no form exists at Facility, make request in writing identifying:

.1 Identification of system or equipment to be isolated, including its location.

.2 Time duration, indicating Start time & date and Completion time & date when isolation will be in effect.

.3 Voltage of service feed to system or equipment being isolated.

.4 Name of person making the request.

.4 Do not proceed with isolation until receipt of written notification from *Departmental Representative* granting the Isolation Request and authorizing to proceed with the work.

.1 Note that *Departmental Representative* may designate another person at the Facility being authorized to grant the Isolation Request.

.5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.

.6 Plan and schedule shut down of existing services in consultation with the *Departmental Representative* and the Facility Manager. Minimize impact and downtime of Facility operations. Follow *Departmental Representative's* directives in this regard. Provide temporary power to other equipment that needs to be remain operational if a shutdown is not possible.

.7 Determine in advance, as much as possible, in cooperation with the *Departmental Representative*, the type and frequency of situations which will require isolation of existing services.

.8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 29.

.9 When entire sections of the facility need to be locked-out to do full demolition a separate temporary construction power distribution is to be provided for this purpose.

1.8 Lockouts

.1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.

- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.
- .3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by workforce to safely isolate an active piece of equipment or electrical facility and effectively lockout and tagout it's sources of energy.
- .4 Provide appropriate safety grounding and guards as required.
- .5 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.
 - .1 A lockout permit shall be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.
 - .2 Duties of person managing the permit system to include:
 - .1 Issuance of permits and lockout tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Making a Request for Isolation to *Departmental Representative* when required as specified above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Ensuring equipment or facility has been properly isolated.
 - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
- .6 Clearly establish, describe and allocate responsibilities of:
 - .1 Workers.
 - .2 Person managing the lockout permit system.
 - .3 Safety Watcher.
 - .4 Subcontractor(s) and General Contractor.
- .7 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
 - .1 Incorporate site specific rules and procedures in force at site as provided by Facility Manager through the *Departmental Representative*.
 - .2 Clearly label the document as being the Lockout procedures applicable to work of this contract.
- .8 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .9 Use industry standard lockout tags.

1.9 Conformance

- .1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.

1.10 Documents On Site

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.
- .3 Upon request, make available to *Departmental Representative* or to authorized safety representative for inspection.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Section 01 35 24 – Special Procedures on Fire Safety Requirements.
- .2 Section 01 35 25 – Special Procedures on Lockout Requirements.

1.2 Definitions

- .1 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.
- .2 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.
- .3 PPE: personal protective equipment.
- .4 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.
- .5 Incident - occurrence, condition, or situation arising in the course of work that resulted in or could have resulted in injury, illness, property damage, environmental issues or fatality.

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 within 10 workdays of notification of Bid Acceptance. Allow for 5-10 days for Department review and recommendations prior to the commencement of work.
 - .2 *Departmental Representative* will review Health and Safety Plan and provide comments.
 - .3 Revise the Plan as appropriate and resubmit within 5 workdays after receipt of comments.
 - .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.
 - .3 Submit name of designated Health and Safety Site Representative and support documentation specified in the Safety Plan.
 - .4 Submit building permit, compliance certificates and other permits obtained.
 - .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other Department of Labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
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- .6 Submit copies of reports or directions issued by Federal or Provincial authorities within 24 hours after the visit to the *Departmental Representative*.
- .7 Submit copies of incident reports (incident, accident, injury, near-miss, fire, explosion, chemical spill or damage to property occurring at the work site) 24 hours after the event to the *Departmental Representative*.
- .8 Submit documented plans as prescribed through Public Health requirements, directions, orders and declarations. Include industry best practices when preparing the plan and revise/update accordingly and in a timely manner as per Public Health requirements and recommended industry best practices.

1.4 Compliance Requirements

- .1 Requirements are as follow:
 - .1 Comply with Occupational Health and Safety Act for Province of Nova Scotia, and Regulations made pursuant to the Act.
 - .2 Comply with Provincial/Federal Public Health requirements, directions, and declarations. Prepare documented plans as prescribed by Public Health and/or industry best practices in consultation with the *Departmental Representative*.
 - .3 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .4 Observe construction safety measures of:
 - .1 NBC 2020, Division B, Part 8.
 - .2 NFC 2020,
 - .3 Municipal by-laws and ordinances.
 - .5 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
 - .6 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
 - .7 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 Responsibility

- The contractor shall,
- .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. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .1 *Departmental Representative* 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 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.
 - .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 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. Maintain records of such orientation on site for review and audit by the DR or their authorized inspector.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm.

1.7 Protection

The contractor shall,

- .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 hazard or condition 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

The contractor shall,

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work. *Departmental Representative* will assist in locating address if needed.

1.9 Permits

The contractor,

- .1 Is responsible to pay all fees to obtain all permits required to conduct the work.
- .2 Is responsible to provide authorities with plans and information for acceptance certificates and the costs arising from same.
- .3 Is responsible to provide inspections certificates as evidence that work conforms to requirements of Authorities Having Jurisdiction (AHJ)
- .4 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site.
- .5 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

The contractor shall,

- .1 Perform a documented site-specific Project hazard assessment for the Work. Include any site issues / hazards / concerns identified arising from the site visit that must be considered.
- .2 Carryout initial assessment prior to commencement of Work with further assessments completed and documented 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 Share information and controls identified from original and updated Project hazard assessments with project workers. Record this information sharing complete with names and dates. Keep documentation on site for entire duration of the Work.

1.11 Project / Site Conditions

- .1 Existing site conditions include overhead power lines and an active harbour facility.
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
- .3 Include above items in the hazard assessment of the Work.
- .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from *Departmental Representative*.

1.12 Meetings

The contractor shall,

- .1 Attend pre-construction health and safety meeting, convened and chaired by *Departmental Representative*, prior to commencement of Work, at time, date and location determined by *Departmental Representative*. Ensure attendance of:
 - .1 Superintendent of Work.
 - .2 Designated Health & Safety Site Representative.
 - .3 Subcontractors.
- .2 Conduct pre shift toolbox talks with the crew and conduct regularly scheduled (minimum bi-weekly) safety meetings during the Work.
- .3 Keep documents on site for review by DR or their authorized rep.

1.13 Health and Safety Plan

The contractor shall,

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
 - .2 Items to include in the Site-Specific Safety Plan;
 - .1 Name of the designated Site Safety Rep showing proof of their competence and reporting relationship in Contractor's company. This person is expected to be on site during all
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- work execution.
- .2 A copy of a current WCB Letter of Good Standing.
- .3 Details as to how WHMIS 2015 / GHS will be managed on site.
- .4 Details as to how the Project work areas will be delineated/protected from other areas of the premises (fences, signs). Must be project specific.
- .5 Details as to how Safety orientations will be managed. Include a summary of what topics are covered in the safety orientation described in this section?
- .6 A copy of a Notice of Project that was sent to the Provincial OHS regulator.
- .7 Project site specific hazard assessment.
- .8 Details as to how toolbox and safety meetings will be held and recorded.
- .9 An organizational chart illustrating supervision and subs (if available) that are assigned to this Project.
- .10 On-site Emergency Response Plans that cover all potential emergency situations that could arise. This should harmonize with the facility if possible. Emergency Contacts: name and telephone number of officials from:
 - .1 General Contractor and subcontractors. (Key personnel)
 - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
 - .3 Local emergency resource organizations.
- .11 List of critical work activities which have a risk of endangering health and safety of Facility users and/or others.
- .12 Details as to how the subcontractors documented safety program will be reviewed and managed prior to allowing them to work on site.
- .13 Details as to how the site safety inspection program will be managed. Include frequency, assignment of responsibility as well as standard inspection form to be used.
- .14 Basic PPE requirements as well as specialized PPE requirements; minimum being hard hat, safety footwear, safety glasses and high visible vest.
- .15 General safety rules as well as the disciplinary protocols to be taken for noncompliance.
- .16 Details as to how Incident investigations will be managed. Include procedure and incident form.
- .3 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 Inspections:
 - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
 - .2 Follow-up and ensure corrective measures are taken.
 - .3 Share inspection reports with crews / subs.
- .6 Cooperate with the Facility's and / or the PSPC Occupational Health and Safety 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 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers. Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.
- .3 Maintain employee records and evidence of training received. Make data available to *Departmental Representative* upon request.
- .4 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; the company shall establish rules to govern the conduct and actions of their employees. These rules should leave no room for discretion and argument. The rules must be enforced, and action should be taken every time a rule is violated.
- .2 Brief persons of the documented disciplinary protocols to be taken for noncompliance. Post rules on site.

1.17 Correction of Non-Compliance

- The contractor shall,
- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by *Departmental Representative*.
 - .2 Provide *Departmental Representative* with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 *Departmental Representative* 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 all incidents to *Departmental Representative*.
- .2 Notify the *Departmental Representative* as soon as reasonably practicable following the incident.
- .3 Ensure the Authority having Jurisdiction is notified as prescribed by applicable legislation.
- .4 Submit report in writing.

1.19 Hazardous Products

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to *Departmental Representative*.

1.20 Blasting

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

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.

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 a conspicuous location on the Work Site in accordance with Acts and Regulations of Province. See local legislation for specifics.
- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan.
 - .2 WHMIS data sheets.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Waste Management and Disposal.

1.2 REFERENCES

- .1 WHMIS: Workplace Hazardous Materials Information System, Health Canada.
- .2 Transportation of Dangerous Goods Act. Transport Canada amended 2011-11-09.
- .3 Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters, Department of Fisheries and Oceans Canada, 1998.
- .4 MBCA: Migratory Birds Convention Act, Environment Canada, 1994.
- .5 Canadian Coast Guard Regulations, Department of Fisheries and Oceans Canada.
- .6 Canadian Shipping Act, Transport Canada, 2001.
- .7 AWWPA: American Wood Preserver Association.
- .8 Canadian Environmental Assessment Act, 2012, amended 2013-11-25.
- .9 Canadian Environmental Protection Act, 1999, amended on 2014-03-28.
- .10 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2013-11-25.
- .11 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10.
- .12 Canadian Navigational Waters Act (CNWA).
- .13 Species at Risk Act, 2002, amended 2013-03-08.
- .14 The Federal Policy on Wetland Conservation, 1991, Environment Canada.

1.3 REFERENCE STANDARD

- .1 Contractor to Submit methods, means, and sequences for compliance with applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.
- .2 Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply to federal lands, works or undertakings. Soil, sediment, water or other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.
- .3 Provincial, territorial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.4 DEFINITIONS

- .1 Archaeological Resources: All tangible evidence of human activity that is of historical, cultural, or scientific interest. Examples include features, structures, archaeological objects or remains at or from an archaeological site, or an object recorded as an isolated archaeological find.
- .2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas.
- .3 Deleterious substance: (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
- .4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.
- .5 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.
- .6 Invasive or alien species refers to a species or subspecies introduced outside its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.
- .7 Navigable water: a canal and any other body of water created or altered as a result of the construction of any work.
- .8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary, or salt-water body that contains water for at least part of each year.
- .9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.
- .10 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .11 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .12 Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for environmental protection and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
 - .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
 - .5 Address topics at level of detail commensurate with environmental issues and required construction tasks.
 - .6 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Wastewater Management Plan identifying methods and procedures for management and discharge of wastewaters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources, and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

1.6 MITIGATION MEASURES

- .1 To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed in the permit), the Contractor must implement the following mitigation measures:
 - .1 Operate machinery in a manner that minimizes disturbance to the bed of the waterbody.
 - .2 Replace/restore any other disturbed habitat features and remediate any areas impacted by the works, undertakings, or activity.
- .2 Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the works undertakings and activities:
 - .1 Install site isolation measures where possible and conduct all in-water works, undertakings and activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse.
 - .2 Regularly inspect and maintain the erosion and sediment control measures and structures during all phases of the works, undertakings, and activities.
 - .3 Schedule work to avoid wet, windy, and rainy periods (and heed weather advisories).
 - .4 Operate machinery from wharf, on land, from barges or on ice.
 - .5 Monitor the watercourse daily to observe signs of excessive sedimentation during all phases of the work, undertaking or activity and take corrective action. During active in-water works, monitor hourly.
- .3 Develop and immediately implement a spill response plan to avoid a deleterious substance from entering a waterbody:
 - .1 Stop works, undertakings and activities in the advent of a spill of a deleterious substance.
 - .2 Report any spills of sewage, oil, fuel, or other deleterious material whether near, or directly into a waterbody.
 - .3 Keep an emergency spill kit onsite during all phases of the works, undertakings, and activities.
 - .4 Attempt to first stop the leak or spill at the source, next contain or capture any materials already released or continuing to be released and finally clean up and remove any escaped materials.
 - .5 Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.
 - .6 Clean-up and appropriately dispose of water contaminated with deleterious substances.

- .7 Maintain all machinery on site free of fluid leaks, aquatic invasive species, and noxious weeds.
- .8 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
- .4 Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat:
 - .1 Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out one or more of their life processes (spawning, rearing, feeding, migrating):
 - .1 Pile driving and underwater cutting activities should not occur at night (between one hour before sunset and one hour after sunrise) during the months of April, May, June, July, September and October to allow for the migration of Atlantic salmon (smolts and adults), American eel (juvenile and adults) and gaspereau.
- .5 Work must comply with all conditions of the Letter of Advice issued by Fisheries and Oceans Canada. A copy of the Letter of Advice must be kept on site at all times.

1.7 TRANSPORTATION

- .1 Transport hazardous materials and hazardous waste in compliance with Federal Transportation of Dangerous Goods Act.
- .2 Do not overload trucks when hauling material. Secure contents against spillage.
- .3 Eliminate free board spillage when excavating, loading, and hauling excavated material.
- .4 Trucks containing excavated material/material from underwater excavation will have watertight boxes.
- .5 Maintain trucks clean and free of mud, dirt, and other foreign matter.
- .6 Avoid potential release of contents and of any foreign matter onto highways, roads and access routes used for the Work. Take extra care when hauling materials. Immediately clean any spillage and soils.
- .7 Before commencement of work, advise a Departmental Representative of the existing roads and temporary routes proposed to be used to access work areas and to haul material to and from the site.
- .8 Machinery is not allowed in water. Refer to 1.6 for equipment requirements that may meet water.
- .9 Construction material and debris are not to become waterborne.
- .10 Any tools, equipment, vehicles, temporary structures, or parts thereof used or maintained for the purpose of building or placing a work in navigable water are not to remain in place after the completion of the project.
- .11 Vessels are to be always permitted safe access through the worksite and assisted as necessary.
- .12 Advise the Canadian Coast Guard, Marine Communication and Traffic Services (MCTS) at (902)564-7751 or toll free at 1-800-686-8676 sufficiently in advance of commencement of work or when deploying or removing site markings in order to allow for appropriate Notices to Shipping/Mariner's action.

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1.8 OPERATION OF MACHINERY

- .1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds.
- .2 Whenever possible, operate machinery on land above the high-water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the water body.

- .3 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
- .4 Biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices.
- .5 All in-water activities should be conducted during low wind, wave and suitable weather conditions.
- .6 Wash down stations will be employed prior to leaving Construction site (harbour); and also, at disposal site. Arrange for sufficient space adjacent to project site for conduct of operations. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor and submitted for review to the Departmental Representative. Co-ordinate use of premises with the Harbour Authority and Departmental Representative.
- .7 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.
- .8 Do not perform cleaning and washdown within a 30-metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area. Abide by requirements and recommendations from Fisheries and Oceans Canada – Fisheries Protection Program in cleaning and wash down of equipment.

1.9 HAZARDOUS MATERIAL HANDLING

- .1 Handle and store hazardous materials on site in accordance with WHMIS procedures and requirements.
- .2 Store all hazardous liquids in location and manner to prevent their spillage into the environment. Hazardous liquids should be used association with a containment pool or pad to catch any drips or leaks.
- .3 Maintain written inventory of all hazardous materials kept on site. List product name, quantity, and storage date.
- .4 Keep MSDS data sheets on site for all items.
- .5 Store and handle flammable and combustible materials in accordance with National Fire Code.
- .6 Workers in contact with hazardous materials must be provided with, and use regulated personal protective equipment and must have the necessary training to know how to handle the different hazardous materials for Health and Safety and according to Environmental Regulations.

1.10 CONTAINMENT AND SPILL MANAGEMENT

- .1 Comply with Federal and Provincial laws, regulations, codes, and guidelines for the storage of fuel and petroleum products on site.
- .2 Do not place fuel storage tanks and store fuel or other petroleum products within a 30-meter buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30-meter buffer zone. Obtain approval from Departmental Representative of acceptable location on site for fuel storage and equipment service. Refuelling should be conducted over a fuel containment pad to catch leaks or spills that may occur during refuelling operations.
- .3 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .4 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.

- .5 Maintain on site appropriate emergency spill response equipment consisting of at least one 250-litre (55 gallon) overpack spill kit for containment and cleanup of spills.
- .6 Maintain vehicles and equipment in good working order to prevent leaks on site.
- .7 In the event of a petroleum spill, immediately notify the Departmental Representative and the Canadian Coast Guard (CCG) at 1-800-565-1633 (24-hour report line). Perform clean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.
- .8 If using a floating barge, the following mitigation measures should be adhered to:
 - .1 Vessels should be compliant with all Canada Shipping Act, 2001, requirements for inspection, which includes certification of the vessel and adequate training and appropriate certification of competency for the operator.
 - .2 Ensure that all vessels will have procedures in place to ensure safeguards against marine pollution: awareness training of all employees, means of retention of waste oil on board and discharge to shore-based reception facilities, capacity of responding to and clean-up of accidental spill caused by vessels involved in any particular part of the project.
 - .3 Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e., 55 gallon) overpack spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environment Emergencies Report System (1-800-565- 1633).
- .9 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.
- .10 Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance.
- .11 Develop and submit to the Departmental Representative an Emergency Response Plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. Include Provincial Environmental Emergency Contact information, and Departmental Representative's contact information.
- .12 Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
- .13 If an oiled seabird is encountered, methodology for the handling and release of marine and migratory birds outlined in Environment and Climate Change Canada (ECCC) – Canada Wildlife Service (CWS)'s Oiled Birds Protocol will be implemented. A permit application must be obtained from ECCC-CWS prior to implementation of this protocol.

1.11 DISPOSAL OF WASTES

- .1 Do not bury rubbish, demolition debris and waste materials on site.
- .2 Dispose and recycle demolition debris and waste materials in accordance with project waste management requirements specified in Section 01 74 21.
- .3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm, or sanitary sewers or in waste landfill sites.
- .4 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

- .5 Concrete waste:
 - .1 Do not discharge residual or rejected concrete on site.
 - .2 Immediately clean any accidental release of concrete on site prior to solidification.
 - .3 Do not wash and clean concrete vehicles on site.
 - .4 Perform dumping of residual material and truck cleaning operations only at the concrete plant. Follow environmental regulations and good practices as approved by the Provincial Department of the Environment and other authorities having jurisdiction.
- .6 Chipped vegetation may be used as mulch but must not be spread into a waterbody or wetland.
- .7 All salvageable stockpiles of creosote timbers must be situated a minimum of 500 meters from any dwelling or water well and a minimum of 100 meters from any watercourse/wetland or environmentally sensitive area. Any stockpile must be contained, off the ground and must be contained on federal land, unless approved by Departmental Representative.
- .8 Debris entering the marine environment should be immediately retrieved when it is safe to do so.
- .9 The contractor must provide the Waste manifest of the deconstruction material, to the Departmental Representative with the progress claim.

1.12 EXCAVATED MATERIAL

- .1 All stockpiled soil must be dyked (complete with silt fencing) to prevent erosion and release of sediment laden water.
- .2 If materials are excavated during proposed project activities, the Departmental Representative must be consulted to identify an appropriate stockpile location for the excavated material to ensure the material, or any part of the material, does not re-enter any waterbody.

1.13 UNDERWATER EXCAVATION AND DISPOSAL OF MARINE SEDIMENT

- .1 Underwater excavation is inclusive of the area under the existing launching ramp required to be excavated as shown on the drawings. Materials are to be removed from the launching ramp and dewatered at an on-site location approved by a Departmental Representative.
- .2 Stockpiled sediment must be sampled by a consultant arranged by the Department Representative to determine disposal options. Sediment must be dewatered prior to sampling. Materials are to be free of debris such as timber, rubber tires, bottles, cans, or any other litter. Stockpiled material must be made available for sampling. Results may take up to 1 week. Once material has been compared to the appropriate disposal guidelines and is approved for disposal it shall be disposed of at a Provincially operated land fill facility.
 - .1 Contaminated materials must be adequately dewatered for transport and acceptance at provincially operated land fill facility.
 - .2 Dewatered materials and associated fluids must be properly managed onsite i.e. not run off site (onto adjacent properties or adjacent bodies of water).
 - .3 Contaminated materials must not be handled without proper PPE (i.e. gloves, safety footwear, etc.) to ensure worker safety. Exposure to workers should be minimized.
 - .4 Contaminated sediment in the area of the launching ramp should be prevented from spreading offsite, creating silt plumes or potentially spreading contamination. Silt fencing and/or containment booms should be employed to prevent off site migration of contaminated materials.

- .3 Conduct work in such a manner to limit turbidity and minimize sediment resuspension in the water to an absolute minimum at all times:
 - .1 Maintain appropriate production speed and momentum of the excavation equipment. Make adjustments as required and as approved by Departmental Representative.
 - .2 Strategically position excavation equipment and haul vehicles to minimize over the water swings of excavated material whenever possible.
 - .3 Avoid overfilling of the excavation bucket.
 - .4 Minimize wash downs of equipment and wharf deck.
 - .5 Restrict the volume of material excavated to the areas and depths in the contract, unless otherwise directed by the Departmental Representative.

1.14 MITIGATION MEASURES DURING UNDERWATER EXCAVATION OPERATIONS

- .1 A marine mammal safety zone must be established at the work site. The safety zone shall consist of a circle with a radius of at least 500 meters as measured from the centre of the work site.
- .2 If marine mammals are observed within the safety zone while in-water activities are underway, all activities must cease until the marine mammals leave the safety zone and are not observed within the safety zone for a minimum period of 30 minutes.
- .3 Work may start or restart if marine mammals are not observed within the safety zone within the 30-minute period.
- .4 Regular watch of the safety zone shall occur at all other times.
- .5 To minimize the re-suspension of sediments in the water column reduce the ascent and descent of the bucket; attempt to achieve full bucket capacity; completely empty the bucket after material is emptied and before continuing; use a rinse tank to remove build-up; minimize over water swings; eliminate free-board spillage; eliminate wash downs on the wharf deck and do not level high spots by the lateral movement of the bucket at depth.
- .6 Bulky debris such as wooden beams, scrap metal, cable, and fishing gear recovered during underwater excavation operations shall not be returned to the marine environment.
- .7 All reasonable measures (in the opinion of the Minister) must be taken to minimize the siltation of the watercourse/waterbody.
- .8 It is the applicant's responsibility to obtain any other necessary forms of approval or permission (ie: permits, etc.) from other government agencies including federal, provincial, and municipal departments or private landowners before the work commences. All work must take place as outlined in permits and approvals.
- .9 The total volume of excavated material must not exceed the approved volume unless otherwise approved in writing by the appropriate authorities or as directed by the Departmental Representative.
- .10 The Proponent must ensure that a copy of the Regulatory Approval is maintained on the job and the excavation site at all times for reference and inspection purposes.
- .11 The area to be excavated must be contained by a floating silt boom/curtain. The floating silt boom/curtain must be monitored and maintained as required to remain effective.
- .12 Any disturbance or destruction of the beach area and/or shoreline caused by the project must be repaired immediately after completion of the work.
- .13 All work must take place as outlined in permits and approvals.

1.15 WATER QUALITY

- .1 During construction activities, a floating silt curtain and/or silt boom must be installed around the work site to prevent any suspended solids and/or debris from entering the adjacent water body. The floating silt curtain must be installed before the commencement of any work activity.
 - .1 The silt curtains will be measured for payment as per Section 01 10 10.
 - .2 The silt curtain must be marked at 10m intervals with 0.4m yellow buoys.
 - .3 The silt curtain is not to be in the path of any vessels.
- .2 Water contamination by preservative treated wood:
 - .1 Preservative treated lumber and timber, whether plant or site treated, shall be cured for a minimum of 30 days from date of the treatment application before their installation in areas which will be in contact with the water.
 - .2 Do not cut treated wood lumber over the surface of a watercourse or wetland.
 - .3 Do not use liquid applied preservative products over the surface of a watercourse or wetland.
 - .4 Wood treated with Chromate Copper Arsenate (CCA), or Ammoniac Copper Zinc Arsenate (ACZA) must be CSA or AWWA approved.
 - .5 Do not use timber and lumber treated with creosote, petroleum, and pentachlorophenol for any part of the Work.
- .3 Contractor is responsible to visually monitor the water turbidity and will be required in the vicinity of the project to ensure that turbidity is limited. If excessive change occurs in the turbidity that differs from the existing conditions of the surrounding water body (i.e., distinct change in water clarity) as a result of the project activities, the work will stop, the contractor will notify the Departmental Representative and implement contingency measures as required.
- .4 Any construction debris entering the marine environment will be immediately retrieved when it is safe to do so.
- .5 The construction material used must be clean and non-toxic (free of fuel, oil, grease, and/or any contaminants).
- .6 The Contractor shall develop, submit for review, and implement an Erosion and Sediment Control Plan.

1.16 SOCIOECONOMIC RESTRICTIONS

- .1 Must abide by municipal and provincial regulations for any restrictions on work performed during the nighttime and on flood lighting of the site. Obtain applicable permits.
- .2 Place and shield flood lights in opposite direction of adjacent residential and business area.
- .3 Equip equipment and machinery with purposely designed mufflers to reduce noise on site to lowest possible level. Always maintain mufflers in good operating condition.
- .4 Adequate signage and safety measures must be supplied during transportation of materials and equipment to the harbour.

1.17 BIRDS AND BIRD HABITAT

- .1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regard to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.

- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves, or ferrying supplies.
- .4 During nighttime work, position flood lights in opposite direction of nearby bird nesting habitat.
- .5 Do not use beaches, dunes, and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the Departmental Representative.
- .6 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 neighboring 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.
- .7 Ensure that food scraps and garbage are not left at the work site and are disposed of in animal proof garbage receptacles.
- .8 Project vehicles will keep to designated project transportation routes and stay within facility property boundaries.
- .9 No staging of vehicles or equipment/material storage will take place on any beaches, wetlands, dunes, or open fields, unless otherwise advised, via permit, by Departmental Representative. The project footprint will not encroach/impact these abovementioned Areas.
- .10 Underwater excavations disposal sites may provide habitat suitable for ground-nesting and burrowing birds, including species of conservation concern such as the Common Nighthawk and Bank Swallow. During the breeding season, it is important that nests not be disturbed by erosion prevention and control measures or by excavation and construction activities. If stockpiles are on site or will be on site, any disturbance to such excavation material stockpiles is not to be undertaken during the regional nesting period for migratory birds. Nest searches must be undertaken by an experienced observer prior to construction activities, and any nests that are discovered must be protected with an appropriate buffer for the species. When disposing or stockpiling excavation material contour faces to have less than a 70-degree vertical slope to discourage bank swallow nesting.

1.18 FISH AND FISH HABITAT

- .1 Avoid wet, windy, and rainy periods that may increase erosion and sedimentation.
 - .2 Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
 - .3 Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
 - .4 Be aware of the risk for contamination of the fish habitat at the site because of alien species being introduced in the water.
 - .5 To minimize the possibility of fish habitat contamination, all construction equipment which will be immersed into the water of a watercourse or has the possibility of coming into contact with such water during the course of the work, must be cleaned and washed to ensure that they are free of marine growth and alien species.
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- .1 Equipment shall include boats, barges, cranes, excavators, haul trucks, pumps, pipelines and other all miscellaneous tools and equipment previously used in a marine environment.
- .6 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
- .7 Conduct cleaning and washing operations as follows:
 - .1 Scrape and remove heavy accumulation of mud and dispose appropriately.
 - .2 Wash all surfaces of equipment by use of a pressurized fresh water, supplied by contractor.
 - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals, and sediments.
 - .4 Checks and remove all plant, animal and sediment matter from all bilges and filters.
 - .5 Drain standing water from equipment and let fully dry before use.
 - .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
- .8 Do not perform cleaning and wash down within a 30-meter buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- .9 Record of Assurance Logbook:
 - .1 Maintain an on-going log of past and present usage and wash down of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
 - .2 Include the following:
 - .1 Date and location where equipment was previously used in a watercourse or wetland.
 - .2 Type of work performed.
 - .3 Dates of wash down for each piece of equipment.
 - .4 Cleaning method and cleaning agent(s) used.
- .10 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.
- .11 Abide by requirements and recommendations of the Federal Department of Environment and the Department of Fisheries and Oceans - Habitat Protection and Sustainable Development Branch in cleaning and wash down of equipment.

1.19 SPECIES AT RISK AND MARINE MAMMALS

- .1 A safety zone for leatherback sea turtles and marine mammals must be established at the work site. The safety zone shall consist of a circle with a radius of at least 500 meters as measured from the center of the work site. This is to protect sensitive marine mammals during activities including, but not limited to blasting, pile-driving, and underwater excavation operations.
- .2 Maintain hourly visual surveys for leatherback sea turtles and marine mammals within the safety zone during blasting, pile-driving, or underwater excavation operations.
- .3 If leatherback sea turtles or marine mammals are observed within the safety zone while in-water activities are underway, all in-water activities must cease until the animals leave the safety zone and are not observed

within the safety zone for a minimum period of 30 minutes. Work may start or restart if marine mammals are not observed within the safety zone within the 30-minute period.

1.20 MITIGATION MEASURES WHEN USING TREATED TIMBER

- .1 Water contamination by preservative treated wood:
 - .1 Preservative treated lumber and timber, whether plant or site treated, shall be cured for a minimum of 30 days from date of the treatment application before their installation in areas which will be in contact with the water.
 - .2 Do not cut treated wood lumber over the surface of a watercourse or wetland.
 - .3 Do not use liquid applied preservative products over the surface of a watercourse or wetland.
 - .4 Wood treated with Chromate Copper Arsenate (CCA), or Ammoniac Copper Zinc Arsenate (ACZA) must be CSA or American Wood Preserver Association (AWPA) approved.
 - .5 Do not use timber and lumber treated with creosote, petroleum and pentachlorophenol for any part of the work.

1.21 MITIGATION MEASURES DURING CONCRETE PLACEMENT

- .1 Concrete placement should stop in moderate to heavy rain (2.6-7.6 mm/hr or more) to prevent leaching contaminants into aquatic environment.
- .2 When concrete repair work is necessary on structures, timber staging will be placed next to the face to prevent concrete from falling into the water, or a cofferdam will be constructed to enclose the work area.
- .3 Forms will have sealed corners to prevent leakage.
- .4 Splash panels to be used during the pour to prevent material from entering the aquatic environment.
- .5 Any accidental release of concrete will be removed prior to solidification.
- .6 Work will cease until the spill is contained and the source of the leak can be identified.
- .7 Contractor must notify the Departmental Representative of all accidental releases of concrete into fish bearing waters and contact applicable federal and provincial regulators immediately.

1.22 AIR QUALITY

- .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
- .2 Apply dust control measures to roads, parking lots and work areas.
- .3 Spray surfaces with water or other environmentally approved product. Use purposely suited equipment or machinery and apply in sufficient quantity and frequency to provide effective result and continued dust control during the entire course of the work.
- .4 Do not use oil or any other petroleum products for dust control.

1.23 INVASIVE SPECIES

- .1 To minimize the possibility of fish habitat contamination and the spread of aquatic invasive species, all construction equipment which will be immersed into the water of a watercourse or has the possibility of encountering such water during the course of the work, must be cleaned and washed to ensure that they are free of marine growth and alien species prior to mobilization to the site.

- .1 Equipment shall include boats, barges, cranes, excavators, haul trucks, pumps, pipelines and other all miscellaneous tools and equipment previously used in a marine environment.
- .2 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
- .3 Conduct cleaning and washing operations as follows:
 - .1 Scrape and remove heavy accumulation of mud and dispose appropriately.
 - .2 Wash all surfaces of equipment by use of a pressurized fresh water supply.
 - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals and sediments.
 - .4 Check and remove all plant, animal and sediment matter from all bilges and filters.
 - .5 Drain standing water from equipment and let fully dry before use.
 - .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
- .4 Record of Assurance Logbook:
 - .1 Maintain an on-going log of past and present usage and washdowns of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
 - .2 Write data in a hard cover bound logbook to include the following:
 - .1 Date and location where equipment was previously used in a watercourse or wetland;
 - .2 Type of work performed.
 - .3 Dates of wash down for each piece of equipment;
 - .4 Cleaning method and cleaning agent(s) used.
 - .3 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.
- .5 The Departmental representative has the right to request a video inspection of the equipment, including hulls, to ensure that they are free of marine growth and alien species prior to mobilization to the site.

1.24 FIRES

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

1.25 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Manage disposal or runoff of water in accordance with local authority requirements.

1.26 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Vegetation removal (ie. tree, shrubs) is not permitted unless approved by Departmental Representative.

1.27 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
- .3 Waterways to be kept free of excavated fill, waste material, and debris.
- .4 Design and construct temporary crossings to minimize the potential for erosion and prevent equipment from entering waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Blasting is not permitted on site.

1.28 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials to prevent blowing dust and debris. Provide dust control for temporary roads.

1.29 HISTORICAL/ ARCHAEOLOGICAL CONTROL

- .1 All construction personnel are responsible for reporting any unusual materials unearthed during construction to the construction supervisor. If the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work in the vicinity of the find and notify a Departmental Representative.
- .2 If an archaeological and / or historically significant item is discovered during the work activities, work in the area will be stopped immediately and the Departmental Representative will be contacted as well as the provincial Archaeological Services unit.

- .3 Work can only resume in the vicinity of the find when authorized by the Departmental Representative and Construction Supervisor, after approval has been granted by the applicable Provincial Agencies.
- .4 In the event of the discovery of human remains or evidence of burials, excavation work will immediately cease, and nearest law enforcement agency will be contacted immediately by the Departmental Representative and/or the Construction Supervisor.
- .5 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .6 Plan must include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.30 NOTIFICATION OF NON-COMPLIANCE

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

Part 2 Execution

2.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction & Demolition Waste Management and Disposal.

END OF SECTION

Part 1 GENERAL

1.1 Description

- .1 Inspection and Testing.
- .2 Tests and Mix Designs.
- .3 Mock-ups.
- .4 Mill test Certificates.

1.2 Related Requirements

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by *Departmental Representative* are specified under various sections.
 - .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 78 00 - Closeout Submittals.

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 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by the Contractor under the supervision of *Departmental Representative*.
- .2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as *Departmental Representative* may require to verify acceptability of corrected work.
- .3 No separate measurement for payment shall be made for items under this section. Include costs incidental to the unit prices where Testing and Quality Control is required, or if no unit exists, include in the lump sum price arrangement.

1.4 Contractor's Responsibilities

- .1 Furnish labour 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.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
-

- .2 Notify *Departmental Representative* sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by *Departmental Representative*.

1.5 Rejected Work

- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by *Departmental Representative* as failing to conform to Contract Documents.
- .2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.

1.6 Mock-ups

- .1 Prepare mock-ups for Work specifically requested in various trade sections. Include in each mock-up all related work components representative of final assembly.
- .2 Construct in locations acceptable to *Departmental Representative*.
- .3 Prepare mock-ups for *Departmental Representative*'s review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Remove mock-up at conclusion of Work or when directed by *Departmental Representative* unless approval is given to remain as part of Work.

END OF SECTION

Part 1 GENERAL

1.1 Access

- .1 Provide and maintain adequate access to project site.
- .2 If authorized to use existing roads or structures for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads.
- .3 The Contractor is to maintain full access to the work site. Should a court injunction be required ordering a person or group to refrain from impeding access to the site, such as a demonstration, picketing or union action, then obtaining the injunction and any associated costs will be considered incidental to this Contract. Any delays associated with such activity will be considered incidental to this Contract.

1.2 Contractor's Site Office

- .1 Establish on the site of the work and keep open at all times during the execution of the work an office where all letters, orders, notices and other communications may be received or acknowledged either by the Contractor or his authorized agent or representative. Provide a telephone in the office.
- .2 Keep one up-to-date copy of contract documents, bulletins and other materials as specified under Section 01 10 10.

1.3 Storage Sheds

- .1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.
- .2 Contractor to make his own arrangements for on-site storage areas.

1.4 Sanitary Facilities

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

1.5 Parking

- .1 Contractor to make own arrangements to provide parking space for work force.

1.6 Power

- .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
- .2 Install temporary facilities for power such as pole lines and cables to approval of local power supply authority.

1.7 Water Supply

- .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.
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1.8 Barricades

- .1 Provide and maintain sufficient barricades, fencing, notices, warning signs, light signals, etc. for the protection of adjoining property and to warn others and workmen engaged on the job of the dangers caused by the work.
- .2 Types and location of barricades, etc. to be in accordance with local regulations and to the satisfaction of *Departmental Representative*.
- .3 The presence of such barricades, lights, etc. shall not relieve the Contractor of the responsibility for any damages.

1.9 Security

- .1 Contractor to make his own arrangements for security of his equipment, materials, damages resulting from fire and theft.

1.10 Site Signs and Notices

- .1 Project Identification and Consultant/ Contractor signboards and notices for safety or instruction are permitted on site.
- .2 Format, location and quantity of site signs and notices to be accepted by *Departmental Representative*.
- .3 Signs and notices for safety or instruction to be in English and French languages, or commonly understood graphic symbols.

1.11 Removal of Temporary Facilities

- .1 Remove temporary facilities from site when directed by *Departmental Representative*.
- .2 When project is closed down for a period of time, keep temporary facilities operational until no longer required by *Departmental Representative*.

END OF SECTION

Part 1 GENERAL

1.1 General

- .1 Use new material and equipment unless otherwise specified.
- .2 Submit following information for any or all materials and products proposed for supply within seven (7) days of request by *Departmental Representative*:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

1.2 Manufacturer's Instructions

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify *Departmental Representative* in writing of any conflict between these specifications and manufacturers' instructions. *Departmental Representative* will designate which document is to be followed.

1.3 Fastenings – General

- .1 All fastenings are to be the sizes indicated on the contract plans and are to be hot dipped galvanized to ASTM A123 unless otherwise noted.

1.4 Delivery and Storage

- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seal and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with supplier's instructions.

1.5 Conformance

- .1 When material or equipment is specified by standard or performance specifications, upon request of *Departmental Representative*, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.6 Substitution

- .1 Proposals for substitution may be submitted only after award of Contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions.
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- .2 Proposals will be considered by *Departmental Representative* if:
 - .1 Products selected by tenderer from those specified, are not available, or
 - .2 Delivery date of products from those specified would unduly delay completion of Contract, or
 - .3 Alternative products to those specified, which are brought to attention of, and considered by *Departmental Representative* as equivalent to those specified and will result in a credit to Contract amount.
- .3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.
- .4 Amounts of all credits arising from approval of substitutions will be determined by *Departmental Representative* and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of *Departmental Representative*.
- .5 *Departmental Representative* reserves the right for acceptance or rejection of substitution of materials.

1.7 Construction Equipment and Plant

- .1 On request, prove to the satisfaction of *Departmental Representative* that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.
- .3 Contractor shall submit construction methodology and provide a stamped letter from a professional engineer registered in Nova Scotia, Canada confirming the proposed construction equipment is within the design capacity of all structures that will be loaded by such construction equipment.

1.8 Damaged and Rejected Materials

- .1 Immediately replace, repair or otherwise make good any material damaged, broken or defaced during construction to the satisfaction of *Departmental Representative*.
- .2 Remove rejected materials from site.

END OF SECTION

Part 1 GENERAL

1.1 Record Drawings

- .1 *Departmental Representative* will provide two (2) sets of white prints for record drawing purposes.
- .2 Maintain project record drawings and accurately record deviations from contract documents caused by site conditions and changes ordered by *Departmental Representative*.
- .3 Mark changes in red coloured ink.
- .4 Record following information:
 - .1 Elevations of various elements in relation to Chart Datum.
 - .2 Field changes in dimensions and details.
 - .3 Changes made by Change Order.
 - .4 Record actual length of pile placed and blow count for final 25 mm of driving on pile schedule provided in the drawings.
- .5 At completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to *Departmental Representative*.

END OF SECTION

Part 1 GENERAL

1.1 General

- .1 Conduct cleaning and disposal operations to comply with local ordinances and antipollution laws.
- .2 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .3 Prevent accumulation of waste which creates hazardous conditions.

1.2 Cleaning During Construction

- .1 Maintain the work, at least on a daily basis free from accumulations of waste material and debris.
- .2 Provide on-site containers for collection of waste materials, and debris.
- .3 Remove waste materials, and debris from site.
- .4 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces.

1.3 Final Cleaning

- .1 In preparation for acceptance of the project on an interim or final certificate of completion perform final cleaning.
- .2 Remove grease, dust, dirt, stains, and other foreign materials, from exterior finished surfaces.

END OF SECTION

Part 1 GENERAL

1.1 Definitions

- .1 Demolition Waste Audit (DWA): Relates to actual waste generated from project.
- .2 Materials Source Separation Program (MSSP): Consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .3 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others
- .4 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 Recycling: Process of sorting, cleaning, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .6 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from remodeling projects before demolition stage for resale, reuse on current project or as storage for use on a future project.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .7 Salvage: Removal of structural and non-structural materials from deconstruction and disassembly projects for the purpose of reuse or recycling.
- .8 Separate Condition: Refers to waste sorted into individual types.
- .9 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.

1.2 Materials Source Separation Program (MSSP)

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Authorities Having Jurisdiction.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimize material damage.
- .7 Collect, handle, store on-site and transport off-site, salvaged materials in separate condition and transport to recycling facility.

1.3 Storage, Handling and Protection

- .1 Unless specified otherwise, materials for removal become the Contractor's property.
 - .2 Protect, stockpile, store and catalogue salvaged items.
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- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to approved local facility.
- .4 Protect structural components not removed for demolition from movement or damage.
- .5 Support affected structures. If safety of facility is endangered, cease operations and immediately notify the *Departmental Representative* and Authorities Having Jurisdiction.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities. On-site source separation is recommended.

1.4 Disposal of Wastes

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of any waste into waterways, storm or sanitary sewers.
- .3 Remove materials from deconstruction as deconstruction / disassembly Work progresses.
- .4 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.5 Use of Site and Facilities

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Provide security measures which are to be approved by *Departmental Representative*.

1.6 Scheduling

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

Part 2 PRODUCTS

NOT APPLICABLE

Part 3 EXECUTION

3.1 Application

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

3.2 Cleaning

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

3.3 Diversion of Materials

- .1 Separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by *Departmental Representative* and consistent with applicable fire regulations and as follows, at a minimum:
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale or distribution of salvaged materials to third parties will not be permitted.

END OF SECTION

Part 1 GENERAL

1.1 Related Sections

- .1 Section 01 78 00 – Closeout Submittals

1.2 Description

- .1 Administrative procedures preceding inspection and acceptance of Work by *Departmental Representative*.

1.3 Inspection and Declaration

- .1 Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
 - .1 Notify *Departmental Representative* in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for *Departmental Representative's* inspection of the completed work.
 - .2 *Departmental Representative's* Inspection: Accompany *Departmental Representative* during all substantial and final inspections of the Work.
 - .1 Address defects, faults and outstanding items of work identified by such inspections.
 - .2 Advise *Departmental Representative* when all deficiencies identified have been rectified.
 - .3 Note that *Departmental Representative* will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
 - .1 The documents required as per Section 01 78 00 closeout submittals.
 - .4 Correct all discrepancies before *Departmental Representative* will issue the Certificate of Completion.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing and Submissions requirements.

1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Defective products shall be rejected, regardless of previous inspections. Replace products at Contractor's expense.

1.3 Final Cleaning

- .1 In preparation for acceptance of the project on an interim or final certificate of completion, perform final cleaning.
- .2 Remove grease, dust, dirt, stains and other foreign materials from finished surfaces.

1.4 As-Builts and Samples

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

1.5 Recording Actual Site Conditions

- .1 Record information on set of blue line opaque drawings, and in copy of Project Manual, as provided by the *Departmental Representative*.
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- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 On Contract Drawings and shop drawings mark each item to record actual construction including, at a minimum:
 - .1 Measured depths of pile tips and driving records.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on the original Contract Drawings.
 - .7 References to related shop drawings and modifications.
 - .8 Other pertinent information as specified or indicated.
- .5 Specifications: Mark each item to record actual construction including, at a minimum:
 - .1 Manufacturer, trade name and catalogue number of each product actually installed, particularly optional items and substituted items.
 - .2 Changes made by Addenda and Change Orders.
- .6 Other Documents: Maintain manufacturer's certifications and field test records required by individual specification sections.

1.6 Final Survey

- .1 Submit final site survey certificate in accordance with Section 01 71 00 certifying that elevations and locations of completed Work are in conformance. Should items of non-conformance with the Contract Documents being found, present these findings to the Departmental Representative to be addressed.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing/Submissions requirements.
- .3 Section 03 20 00 – Concrete Reinforcing.
- .4 Section 03 30 00 – Cast-in-Place Concrete.

1.2 Reference Standards

- .1 Do concrete formwork and falsework in accordance with CSA standard A23.1:19, Concrete Materials and Methods of Concrete Construction, except where more stringent standards specify otherwise.
- .2 CSA S269.1-16, Falsework and formwork.

1.3 Submissions

- .1 Shop Drawings:
 - .1 Upon request, submit to *Departmental Representative* for review four (4) sets of formwork and falsework shop drawings, including formwork for piles jackets, in accordance with Section 01 33 00, at least four (4) weeks prior to erection. All such drawings to be stamped and signed by a Professional Engineer registered in the Nova Scotia, Canada.
 - .2 Clearly indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations of temporary embedded parts. Comply with CSA S269.1 for falsework drawings.
- .2 Product Data/Samples:
 - .1 Provide product data and samples for form ties.
- .3 Provide submissions in accordance with Section 01 33 00.

Part 2 PRODUCTS

2.1 Materials

- .1 Formwork lumber: plywood and wood formwork materials to CSA A23.1.
 - .2 Falsework materials: to CSA S269.1.
 - .3 Form stripping agent: colourless mineral oil, free of kerosene, with viscosity between 70s and 110s Saybolt Universal, 15 to 14 mm²/s at 40 degrees Celsius, flash-point minimum 150 degrees Celsius, open cup.
 - .4 Form ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface. When forms are removed, no metal shall be embedded less than 75 mm from the surface of the concrete.
-

Part 3 EXECUTION

3.1 Erection

- .1 Verify lines and levels before proceeding with formwork and ensure dimensions agree with drawings.
- .2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1.
- .3 Line forms with material only as approved by *Departmental Representative*.
- .4 Construct falsework in accordance with CSA S269.1.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Use 25 mm chamfer strips on external corners.
- .7 Clean formwork in accordance with CSA A23.1, before placing concrete.
- .8 Leave formwork in place for at least seven (7) days, exclusive for days when temperature falls below 5 degrees Celsius, unless otherwise directed by *Departmental Representative*.
- .9 Re-use of formwork and falsework subject to requirements of CSA A23.1.
- .10 All holes from form ties and rods to be plugged with mortar to requirements of CSA A23.1. When forms are removed, no metal will be less than 25 mm from the surface of the concrete.

3.2 Falsework

- .1 Contractor to design and construct formwork and falsework to resist severe exposed wave conditions.
- .2 Submit formwork and falsework design to *Departmental Representative* for review prior to construction.
- .3 Formwork and falsework design to be approved by an Engineer registered in the Nova Scotia, Canada.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing and Submission requirements.
- .3 Section 03 10 00 – Concrete Forming and Falsework.
- .4 Section 03 30 00 – Cast-in-Place Concrete.

1.2 Reference Standards

- .1 CSA A23.1:19, Concrete Materials and Methods of Concrete Construction.
- .2 Reinforcing Steel Manual of Standard Practice (latest edition) by Reinforcing Steel Institute of Ontario.
- .3 CSA G30.18-09 (R2021), Carbon Steel Bars for Concrete Reinforcement.
- .4 ASTM A1064/A1064M-18a, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

1.3 Source Sampling

- .1 Provide *Departmental Representative* with certified copy of mill test of steel supplied showing physical and chemical analysis not less than two (2) weeks prior to commencement of work.

1.4 Submissions

- .1 Shop Drawings:
 - .1 Clearly indicate bar sizes, spacing, location and quantities of reinforcement and mesh with identifying code marks to permit correct placement without reference to structural drawings; to Reinforcing Steel Manual of Standard Practice.
 - .2 Detail placement of reinforcing where special conditions occur.
 - .3 Design and detail lap lengths and bar development lengths to CSA standard A23.1, unless otherwise specified on drawings.
 - .4 Reinforcement shop drawings shall be stamped and signed by a professional engineer registered in Nova Scotia, Canada.
- .2 Product Data/Samples:
 - .1 Provide product data for supports and spacers.
- .3 Test Results:
 - .1 Provide Mill Test Certificates cross referenced to the product supplied to the site.
- .4 Provide submissions in accordance with Section 01 33 00.

1.5 Storage

- .1 Store reinforcing steel on racks or sills that will permit easy access for identification and handling and prevent it from becoming coated with material which would adversely affect bond.
-

- .2 Do not store reinforcing steel in direct contact with the ground.

1.6 Measurement for Payment

- .1 This item will not be measured separately.
- .2 Wire ties and spacers to be considered incidental to supply and placing of reinforcement.

Part 2 PRODUCTS

2.1 Materials

- .1 Reinforcing steel: to CSA G30.21; billet steel grade 400 deformed bars.
- .2 Wire ties: to ASTM A1064 plain, cold drawn annealed steel wire.
- .3 Spacers: PVC, Fabricated to suit site dimensions.

2.2 Reinforcing Steel Fabrication

- .1 Fabricate reinforcing to CSA standard A23.1
- .2 Fabrication tolerances for reinforcing steel to Reinforcing Steel Manual of standard Practice.
- .3 Obtain *Departmental Representative's* acceptance for locations of reinforcement splices other than those shown on reinforcing shop drawings.
- .4 Ship bundles of bar reinforcement clearly identified in accordance with bar list.
- .5 Do not weld reinforcing steel.

Part 3 EXECUTION

3.1 Placing

- .1 Accurately place reinforcing in positions indicated and hold firmly during placing, compacting and setting of concrete.
- .2 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.

3.2 Field Bending

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

3.3 Cleaning

- .1 Clean reinforcing before placing concrete.
- .2 All reinforcement shall be clear of snow and ice before placing concrete.

3.4 Inspection

- .1 Do not place concrete until *Departmental Representative* has inspected and accepted reinforcement work in place.

3.5 Surface Conditions

- .1 Reinforcement, at time concrete is placed, to be free from mud, oil or other non-metallic coatings that adversely affect bonding capacity.
- .2 Reinforcement, with rust, mill scale, or combination of both may be considered as satisfactory provided the minimum nominal dimensions, nominal weight, and average height of deformations of a hand wire brushed test specimen are not less than specified requirements in applicable CSA Standards.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information on aggregates, form work and false work, concrete reinforcement, miscellaneous items.
- .2 Refer to Section 01 33 00 for Shop Drawing and Submissions requirements.
- .3 Section 03 10 00 – Concrete Forming and Falsework.
- .4 Section 03 20 00 – Concrete Reinforcing.

1.2 Reference Standards

- .1 Do structural concrete work in accordance with CSA A23.1:19, Concrete Materials and Methods of Concrete Construction, except where more stringent standards specify otherwise.
- .2 Do testing for concrete in accordance with CSA standard A23.2:19, Methods of Test for Concrete, except where stricter standards specify otherwise.
- .3 CSA A3000-18, Cementitious Materials Compendium.
- .4 ASTM C494/C494M-19, Standard Specification for Chemical Admixtures for Concrete.
- .5 ASTM C1116/C1116M-10a (2015) Standard Specification for Fiber-Reinforced Concrete.
- .6 ASTM C309-19, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .7 ASTM C881/C881M-20a, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- .8 ASTM D1751-18, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .9 ASTM D412-16, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
- .10 ASTM C260/C260M-10a (2016), Standard Specification for Air-Entraining Admixtures for Concrete.
- .11 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.
- .12 ASTM C719-14 (2019), Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

1.3 Submissions

- .1 Shop Drawings:
 - .2 Submit shop drawings and erection drawings for formwork and falsework. All such drawings to be stamped and signed by a Professional Engineer registered in the Nova Scotia, Canada.
 - .1 Submit placement drawings for reinforcing steel.
 - .2 Submit placement drawings for miscellaneous items.
 - .3 Product Data/Samples:
 - .1 Provide technical data and/or samples for curing compounds (winter/summer/green/white/red), evaporation retardant and finishing aids, expansion joint materials/sealants, grouts.
 - .4 Certificates:
-

- .1 Minimum four (4) weeks prior to starting concrete work submit to *Departmental Representative* manufacturer's test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:
 - .1 Portland cement.
 - .2 Admixtures.
 - .3 Provide certification that plant, equipment, and materials to be used in concrete work comply with requirements of CSA A23.1.
 - .4 Provide certification that mix proportions selected will produce concrete of specified quality, yield, and strength and will comply with CSA A23.1.
 - .5 Provide certification that concrete will not include alkali - reactivity aggregates.
- .5 Methodology and Quality Control:
 - .1 Submit for review methodology and quality control procedures for the following:
 - .1 Cold weather concreting.
 - .2 Hot weather concreting.
 - .3 Concrete placement operations. Provide details of pour sequence and proposed layout of construction joints. Unless otherwise approved, the spacing of deck construction joints shall not exceed 13.5m.
 - .4 Construction Joints:
 - .1 No deviation be permitted without Department Representative agreement where construction joints are specifically called in the construction drawing.
 - .2 Additional Construction joints due to limitation of formwork or concrete shall be kept to minimum and their locations shall be decided as agreed by Department Representative.
 - .3 The position of the joints shall generally be selected at point of minimum shear and at right angles to the main reinforcing bars in the members.
 - .4 Stop ends for vertical joints shall be removed as soon as practicable without any damage to the concrete face. The surface shall be roughened to remove all laitance, without disturbing the coarse aggregate by pressure jetting with air and water or by wire brushing. Care shall be taken to ensure that the Joint is clean prior to placing fresh concrete. The new concrete shall be well worked against the old face to ensure good joint.
 - .5 The use of expanded metal or other perforated material as a stop-end is not acceptable.
 - .6 Care shall be taken not to break the concrete-steel bond at any time.
 - .7 Prior to placing new concrete against hardened concrete, the surfaces shall properly clean, moist and treated with approved bonding agent in accordance with the manufacturer's instructions.
 - .5 Expansion and Contraction Joints:
 - .1 Details and positioning of these joints, together with the materials to be used, shall be as indicated on the construction drawings. Reinforcement shall not be extended across the joints, and the cover to the reinforcing bars at the side of joints shall be as specified. Joints shall be properly constructed, as the failure of any joint sealants would allow chlorides to attack the reinforcements.
 - .6 Concrete deck finishing operations.

- .7 Supporting reinforcing steel.
 - .8 Protection and curing of concrete in cold and hot weather. During the curing period the concrete shall be protected from the damaging mechanical disturbances, particularly load stresses, heavy shocks and excessive vibration. All finished concrete surfaces shall be protected from any damages caused by equipment, material or curing methods, and by rain or running water. Self supporting structures shall not be loaded in such a way as to over stress the concrete.
 - .9 Submit methodology for curing and crack control. To be stamped and signed by a Professional Engineer registered to practice in the Nova Scotia, Canada. All concrete deck pours to be wet cured for 7 days. Concrete deck to be sprayed with fogging machine until wet curing can begin.
- .6 Test Results:
- .1 Provide design mix tests results.
 - .2 Provide mill test certificates for reinforcing steel.

1.4 Measurement for Payment

- .1 Cast-in-place concrete will be measured in accordance with Section 01 29 00.
- .2 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to the Work.
- .3 Supply of anchor bolts, washers and nuts will not be measured but considered incidental to the Work. Bolt grouting will be considered incidental to the Work.
- .4 Supply and installation of ridged PVC sleeves, and curing compounds required will be considered incidental to the Work.

1.5 Storage of Materials

- .1 Store all materials to prevent contamination or deterioration, whether at the plant or at the job site.
- .2 Store cement in watertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment whether at the plant or at the job site.
- .3 Prevent stored liquid admixtures and compounds from freezing and powdered admixtures and compounds from absorbing moisture.
- .4 Use storage methods which prevent damage and straining of pre-cast concrete elements.

1.6 Source Sampling

- .1 At least four (4) weeks prior to commencing work, inform *Departmental Representative* of proposed source of aggregates and provide access for sampling.

1.7 Ready-Mix Concrete Supply

- .1 Provide, with each load of concrete delivered to site, duplicate delivery slips containing following:
 - .1 Name of ready-mix batch plant.
 - .2 Serial number of tickets.
 - .3 Date and truck number.
 - .4 Project identification.

- .5 Class of concrete or mix.
- .6 Amount of concrete in cubic metres.
- .7 Time of loading or first mixing of aggregate, cement and water.
- .8 Time of discharge of concrete.
- .9 Admixtures added at plant.
- .10 Amount of water added at plant.

Part 2 PRODUCTS

2.1 Materials

- .1 Aggregates: to CSA A23.1, for Class "C-1" exposure.
- .2 Portland Cement: to CSA A3000, moderate type 20.
- .3 Water: to CSA A23.1.
- .4 Admixtures:
 - .1 Air entraining admixtures: to ASTM C494.
 - .2 Chemical admixtures: to CSA A3000 and ASTM C494.
 - .3 Pozzolanic mineral admixtures: to CSA A3000.
- .5 Non-shrink grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents, of pouring and/or pumping consistency, capable of developing compressive strength of 50 MPa at 28 days.
- .6 Curing compound: To ASTM C309 and CSA A23.1 type 1, I-D, or 2.
- .7 Adhesive Anchors: high strength epoxy to ASTM C881, Type IV, Grade 3. Acceptable material: Epcom Ceramic 6, Hilti HIT HY-200 or approved equal.
- .8 Bar Splice System: BPI standard bar splicer system coupler or approved equal. Protective plugs shall be installed.

2.2 Concrete Mixes

- .1 Prior to starting concrete work, submit to the *Departmental Representative* the proposed mix design(s) for approval. Mix design (s) to be in accordance with Alternative 1 of Table 5 in CSA A23.1. Comply with additional requirements of CSA A23.1, clause 4.1.1.5 for concrete exposed to sea water or sea water spray.
 - .1 Mix 1: Use concrete mix designed to produce air entrained concrete meeting the following requirements for all cast in place concrete unless otherwise noted:
 - .1 Cement to be moderate Portland cement, Type 20.
 - .2 Minimum compressive strength at 28 days: 35 MPa.
 - .3 Exposure: Class C-1.
 - .4 Maximum aggregate size to CSA A23.1 table 11, Group 1, 20 mm size.
 - .5 Minimum Cement content 390 kg/m³.
 - .6 Air content: 6 to 8%.
 - .7 Maximum water/cement ratio to be 0.40.

- .8 Slump at time and point of discharge $80 \text{ mm} \pm 20 \text{ mm}$. Where the nature of the work requires larger slumps, they are to be obtained by the use of admixtures rather than increasing the water content. Use of such admixtures and the increase in slump to be approved by the *Departmental Representative* prior to implementation in the work.
- .2 Modify concrete mix to the approval of the *Departmental Representative* to accommodate pumping.
- .3 Admixtures to the approval of the *Departmental Representative* and the recommendation of the manufacturer. Admixtures must be dispersed separately into mixing water.
- .4 Do not use calcium chloride or compounds containing calcium chloride.
- .5 Weigh aggregates, cement, water and admixtures separately when batching. Inspect and test scales for accuracy as directed. Accuracy to be such that successive quantities can be measured to within one percent of desired amounts. Test certificates to be submitted to *Departmental Representative* upon request.
- .6 Where seven-day strength is less than 70% of specified 28-day strength, provide additional protection and curing, and make changes to mix proportions to the satisfaction of the *Departmental Representative*.
- .7 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1.
- .8 Provide certification from independent testing and inspection company that selected mix proportions will produce concrete of specified quality and can be effectively placed and finished for all work under this contract.

Part 3 EXECUTION

3.1 General

- .1 Obtain *Departmental Representative's* approval before placing concrete. Provide 24 hours' notice of intended placement. Concrete to be placed in dry form condition.
- .2 Place, consolidate, finish, cure and protect concrete to CSA A23.1 except where specified otherwise.
- .3 Prior to placing of concrete, obtain *Departmental Representative's* approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .4 Comply with additional requirements of CSA A23.1 except where specified otherwise, for concrete exposed to seawater environment.
- .5 Do not commence placing concrete until *Departmental Representative* has inspected/reviewed forms, inserts, dowels, reinforcing steel, joints, conveying, consolidation and protective methods.
- .6 Ensure that reinforcement and anchorage are not disturbed during placing.
- .7 Maintain accurate records of placed concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .8 Do not place load(s) upon new concrete until *Departmental Representative* is satisfied that the Contractor has carried out all calculations and tests necessary to confirm that the load(s) will not cause damage or create a safety hazard. Calculations and tests to be stamped by a Professional Engineer registered in the Nova Scotia, Canada.

3.2 Reinforcing Steel

- .1 Place new reinforcing steel according to Section 03 20 00.

- .2 Provide 75 mm minimum cover for all reinforcing steel unless indicated otherwise on drawings.

3.3 Formwork

- .1 Verify field dimensions to determine applicable sizes of formwork.
- .2 Design and construct form work to allow adequately for proper placement and consolidation while conforming with shape and dimensions shown on plans.
- .3 Formwork design will include closures at both top and bottom of form, and all necessary hardware to support the forms.
- .4 Upon request, submit drawings for review by the *Departmental Representative*, at least 3 weeks before placement of concrete. Drawings will show formwork details and illustrate dimensions, method of placing of concrete, connections and support.
- .5 Strip formwork after minimum seven (7) days. This condition might be waived only if an alternative method to curing and preventing alternate wetting and drying is provided, to the satisfaction of the *Departmental Representative*. This condition will be waived if the forms are left permanently in place, where approved by the *Departmental Representative*.

3.4 Placement of Concrete

- .1 Place and consolidate concrete to CSA A23.1. Concrete to be placed in dry form condition, by coordinating pour with low tide.
- .2 If allowed by *Departmental Representative*, pump concrete to following requirements:
 - .1 Arrange equipment so that no vibrations result which might damage freshly placed concrete.
 - .2 Where concrete is conveyed and placed by mechanically applied pressure, provide suitable equipment.
 - .3 Operate pump so that concrete, without air pockets, is produced.
 - .4 When pumping is discontinued and concrete remaining in pipeline is to be used, void pipe line in a manner that prevents contamination of concrete or separation of ingredients.
- .3 Concrete will be deposited in all cases as neatly as practicable, directly in its final position, and will not be caused to flow in a manner to permit or cause segregation.
- .4 Each layer of concrete will be vibrated and tamped with an appropriate vibrator as allowed by the *Departmental Representative*. The concrete must be compacted to the maximum practicable density, free of air pockets, and until it is in complete contact with the reinforcement and formwork.

3.5 Inserts

- .1 Set galvanized sleeves and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 X 100 mm not indicated on drawings must be approved by *Departmental Representative*.
- .2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from *Departmental Representative* before placing of concrete.
- .3 Galvanized items embedded in concrete will be completely separated from reinforcing steel.
- .4 Anchor bolts:

- .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
- .2 With *Departmental Representative's* concurrence, grout anchor bolts in pre-formed holes or holes drilled after concrete has set. Formed holes to be at least 100 mm in diameter. Drilled holes to be minimum 25 mm larger in diameter than bolts used.
- .3 Protect anchor bolt holes from water accumulations.
- .4 Set bolts and fill holes with non-shrink grout.
- .5 Anchor bolts for base plates will be set to allow at least 25 mm of grout under the base plates.

3.6 Protection and Curing

- .1 Provide protection and curing in accordance with CSA A23.1.
- .2 Protect concrete with windproof shelter to allow free circulation of inside air around fresh concrete. Do not let walls of shelter touch formwork and provide sufficient space for removal of formwork.
- .3 Supply approved heating equipment to maintain inside air at following temperatures:
 - .1 For an initial three days, at not less than 10° C nor more than 25° C at surfaces.
 - .2 At not less than 10° C for an additional 4 consecutive days or for the time necessary to attain 70% of the specified 28-day compressive strength of the concrete.
 - .3 Reduce temperature near end of curing period at rate not exceeding 20° C per day.
 - .4 Do not overheat.
- .4 Keep concrete surfaces continuously moist during protection stage and allow concrete to dry before removal of protection.
- .5 Freshly deposited concrete will be protected from premature drying and excessively hot and cold temperatures, will be maintained without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete. It will be protected from harmful effects of sunshine, drying winds, cold weather, running or surface water and mechanical shock.
- .6 Wood floating, broom finishing, placing of burlap and inspection of concrete to be done from transverse bridges of rigid construction free from wobbles and springing under use, unless other methods have been submitted and accepted.
- .7 All concrete deck pours to be wet cured for 7 days. Concrete deck to be sprayed with fogging machine until wet curing can begin.

3.7 Finishing

- .1 Finish concrete in accordance with CSA A23.1.
- .2 Grind off fins, nibs and other raised protuberances with an approved hand stone.
- .3 When concrete has hardened sufficiently, give deck surface a uniform finish free from porous spots, irregularities, depressions, small pockets or rough spots using a power float leaving a rough spiral finish with one pass of the float.
- .4 Following use of power float, provide coarse broom finish using steel wire or stiff, coarse, fibre broom. Use broom in a transverse ridge satisfactory to *Departmental Representative*. Brooming will be delayed until concrete is sufficiently hard to retain ridges.
- .5 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise detailed.

- .6 All concrete at construction joints shall be intentional roughened to an amplitude of +/- 5 mm at a spacing of +/- 15 mm.

3.8 Joint Fillers

- .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by *Departmental Representative*. When more than one piece is required for a joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
- .2 Locate and form separation joint as indicated. Install joint filler.
- .3 Unless indicated otherwise, use 25 mm thick joint filler to separate two walls and extend joint filler within 25 mm of finished concrete surface.

3.9 Field Quality Control

- .1 Inspection and testing of concrete and concrete materials will be carried out by Testing Laboratory designated by the *Departmental Representative* in accordance with CSA A23.1 and CSA A23.2.
- .2 *Departmental Representative* will pay for costs of tests as specified in Section 01 45 00.
- .3 *Departmental Representative* will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .4 If tests do not meet requirements of the *Departmental Representative*, take such measures as indicated in CSA A23.1 and CSA A23.2.
- .5 Arrange and pay for inspection and testing when necessary for production control to meet requirements.
- .6 Inspection and testing by *Departmental Representative* will not augment Contractor's quality control or relieve him of contractual responsibility.

3.10 Defective Work

- .1 Concrete is defective when:
- .1 Failing to meet any requirement of this specification.
 - .2 Concrete contains honeycombing or embedded debris.
 - .3 28-day strength in any area is less than 95% of specified minimum.
- .2 Repair or remove and replace defective work as directed by the *Departmental Representative*.
- .3 Take corrective measures as directed by the *Departmental Representative* to prevent occurrence of further defective concrete.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing/ Submissions requirements.
- .3 Section 03 10 00 – Concrete Forming and Falsework.
- .4 Section 03 20 00 – Concrete Reinforcing.
- .5 Section 03 30 00 – Cast-in-Place Concrete.

1.2 Reference Standards

- .1 Do Concrete work in accordance with CSA standard A23.1-14, Concrete Materials and Methods of Concrete Construction, except where stricter standards specify otherwise.
- .2 Do testing for concrete in accordance with CSA standard A23.2-14, Methods of Test for Concrete, except where stricter standards specify otherwise.
- .3 CSA A3000-13, Cementitious Materials Compendium.
- .4 ASTM C494/C494M-17, Standard Specification for Chemical Admixtures for Concrete.

1.3 Definitions

- .1 Tremie concrete is placed underwater through a tube called a tremie pipe. Tremie pipe has a hopper at upper end and may be open ended or may have a foot valve, plug or travelling plug to control flow of concrete. Concrete is placed in hopper and a sufficient head of concrete is maintained in tremie pipe to provide desired rate of flow.
- .2 Pumped concrete method of placing concrete underwater uses a concrete pump with a discharge line used in a similar manner to a tremie pipe.
- .3 Bagged concrete method of placing underwater concrete consists of a diver placing bags partially filled with concrete mix.

1.4 Samples

- .1 Submit shop drawings in accordance with Section 01 33 00 - Shop Drawings, Product Data, Samples and Mock-Up.
- .2 Shop drawings shall clearly indicate the size and location of existing voids beneath the wharf end and the procedures for filling and restraining the pumped concrete. All materials shall be clearly identified on these drawings.

1.5 Certificates

- .1 Minimum 2 weeks prior to starting concrete work submit to Departmental Representative, manufacturer's test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:
 - .1 Cement Type 50
-

- .2 Admixtures
- .3 Aggregates
- .4 Water

- .2 Provide certification that plant, equipment and materials to be used in concrete comply with requirements of CSA standard A23.1
- .3 Provide certification that selected mix proportions will produce concrete of specified quality, yield, strength, and will comply with CSA standard A23.1

1.6 Ready-Mix Concrete Supply

- .1 Provide with each load of concrete delivered to site, duplicate delivery slips containing following:
 - .1 Name of ready-mix batch plant.
 - .2 Serial number of tickets.
 - .3 Date and truck number.
 - .4 Project number or Project Name
 - .5 Class of concrete or mix.
 - .6 Amount of concrete in cubic metres.
 - .7 Time of loading or first mixing of aggregate, cement and water.
 - .8 Time that discharge of concrete begins and ends.
 - .9 Type and quantity of admixtures added at plant.
 - .10 Quantity of water added at plant.

Part 2 PRODUCTS

2.1 Materials

- .1 Portland Cement: to CSA A3000, Use type 50 cement.
- .2 Water, fine aggregates, normal density, coarse aggregates: to CSA standard A23.1
- .3 Air entraining admixture: to CSA A23.5
- .4 Concrete bags: constructed of coarsely woven material to allow concrete to bond between bags, and capable of containing 0.030 M³ of concrete.
- .5 Reinforcing Steel: Comply with Section 03 20 00.

2.2 Concrete Mixes

- .1 Concrete grout, for pumped concrete.
 - .1 Use type 50 cement: 342 kg/m³.
 - .2 Maximum water cement ratio 0.45.
 - .3 Fine aggregate: 1159 kg/m³.
 - .4 Superplasticizer - To ASTM C494, Type A and F, Rheobuild 1000, or approved equal as per manufacturer instruction: 1 L/100 kg of cement.
 - .5 Compressive strength min. 35 MPa @ 28 days.

- .6 Slump 100 to 125 mm.

2.3 Admixtures

- .1 Admixtures will be subject to approval of Departmental Representative. Admixtures will only be permitted to correct deficiencies in mix or to improve placement of concrete.
- .2 Departmental Representative may withdraw prior approval of admixture if conditions encountered during course of work indicate unsatisfactory performance.
- .3 Do not use calcium chloride or materials containing calcium chloride.

Part 3 EXECUTION

3.1 General

- .1 Perform concrete work in accordance with CSA standard A23.1

3.2 Preparation

- .1 Notify Departmental Representative at least 24 hours in advance of intention to commence underwater work.
- .2 Prior to placement of concrete bags and pumped concrete remove silt, soft material, organic material and debris from the undermined area and beneath timber cribwork. Use high pressure water jets or an air hose.
- .3 Place concrete in one continuous operation to full depth required. Provide sufficient supply of concrete to complete pour without interruption and supply complete equipment for every phase of operation.

3.3 Tremie Method

- .1 Provide tremie pipe which is watertight and sufficiently large to allow free flow of concrete. Diameter of tremie pipe to be not less than 250 mm or less than eight times maximum size of coarse aggregate.
- .2 Provide hopper at top of tremie pipe and means to raise and lower tremie.
- .3 Provide plug or foot valve at end of tremie pipe to permit filing pipe with concrete initially.
- .4 Provide minimum of 2 tremie pipes for every 9m² of pour plan area or maximum of 3 m centre to centre. Do not move tremie pipes laterally by dragging through concrete.
- .5 Start pour with tremie pipe full of concrete and keep end of pipe buried in freshly placed concrete at least 300 mm. Control rate of flow by increasing or decreasing depth of end in concrete.
- .6 If seal is lost, allowing water to enter pipe, withdraw pipe immediately.
- .7 If tremie operation is interrupted so that a horizontal construction joint has to be made, cut surface laitance by jetting, within 24 to 36 h and remove loose material by pumping or air lifting before placing next lift.
- .8 Do not place concrete in flowing water. Do not vibrate, disturb or puddle concrete after it has been placed.

3.4 Pumped Concrete Method

- .1 Follow procedures as for tremie method in placing concrete using discharge line form concrete pump as tremie pipe.

3.5 Bagged Concrete Method

- .1 Place bagged concrete on prepared hard bottom as shown on the plan in an approved manner. Ensure bag is stable and securely resting in foundation material or previously placed bags.
- .2 Place bagged concrete to form retaining dams as required for placing of pumped concrete.
- .3 Secure bagged concrete to existing foundation and to adjacent concrete bags by driving min. of 2-15M bars min. 600 mm long through concrete bag.
- .4 Concrete bags to be filled just prior to placing, fill gabs not more than 80% full, before placing.

3.6 Rigid Formwork

- .1 Rigid formwork may be used to form the perimeter of areas designated for pumped concrete provided:
 - .1 Rigid formwork extends above the base and in front of the structure by 150mm (minimum) to ensure the concrete will provide full support for the structure.
 - .2 The toe of the repair area is protected with concrete bags to prevent undermining and provide an adequate seal with the harbour bottom. The bags are to extend 3 courses above the harbour bottom and 3 bags across from the wharf face.
- .2 Place bagged concrete at the ends of the pumped concrete limits to provide an interior seal for the pumped concrete.

END OF SECTION

Part 1 GENERAL

1.1 Reference Standards

- .1 ASTM A123/A123M-17, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A307-14e1, Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
- .3 CSA G40.20-13 / G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel
- .4 CSA S16-14, Design of Steel Structures.
- .5 CSA W59-18, Welded Steel Construction.
- .6 CSA S157-17, Strength Design in Aluminum.
- .7 CSA W59.2-18, Welded Aluminum Construction

1.2 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawings and Submissions requirements.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 33 00.
- .2 Shop Drawings:
 - .1 Clearly indicate the following items:
 - .1 General arrangements, dimensions, clearance locations and directions of assemblies as installed on structures.
 - .2 Locations, sizes and installation tolerances of anchor bolts, eye bolts and embedded parts.
 - .3 Types of materials used, finishes and core thickness.
 - .4 All other pertinent details and accessories.
 - .3 Test Results:
 - .1 Provide test results for the galvanized items.
 - .4 Submissions
 - .1 Provide submissions in accordance with Section 01 33 00.

Part 2 PRODUCTS

2.1 Materials

- .1 Steel Sections: to CSA G40.21, Grade 350W.
 - .2 Steel rod, plate and angles: to CSA G40.21, Grade 300W.
-

- .3 Steel angles for panel support clips: to CSA G40.21, Grade 350W.
- .4 Welding materials: to CSA W59
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m² to ASTM A123. All hardware to be galvanized unless otherwise noted on the drawings.
- .7 Zinc primer: Zinc rich, ready mix to ASTM 123.
- .8 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
- .9 For adhesive anchors see Section 03 30 00 – Cast-in-Place Concrete.
- .10 Steel Tie Rods:
 - .1 Substitute different size or strength of tie rods only if permitted in writing by *Departmental Representative*.
 - .2 Tie rod shall conform to ASTM A722/A722M, minimum yield strength of 827 MPa, unless indicated otherwise.
- .11 Aluminum to consist of 6061-T6 marine alloy.
- .12 Welding of aluminum to be mig welding with S356 filling alloy in accordance with CSA W47.2.

2.2 Fabrication

- .1 Build work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Fabricate items from steel unless otherwise noted.
- .3 Where possible, fit and shop assemble work, ready for installation.
- .4 Ensure exposed welds are continuous for length.

2.3 Miscellaneous Metal Work Items

- .1 Miscellaneous anchors, bolts and inserts:
 - .1 Where size, spacing and the like are not indicated, provide as necessary for the purpose.
 - .2 Galvanize all miscellaneous anchors, bolts and inserts.
- .2 Miscellaneous Steel:
 - .1 Provide miscellaneous steel as required for guide units and the like to shape, size and details required.
 - .2 Galvanize all miscellaneous steel items.

Part 3 EXECUTION

3.1 Erection

- .1 Install metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .2 Make field connections with bolts to CSA S16, or weld.

- .3 Touch-up bolts and scratched surfaces after completion of erection with zinc primer.

3.2 Dissimilar Metals

- .1 Isolation between black reinforcing steel and galvanized anchor bolts is required and is the responsibility of the contractor to avoid potential galvanic reaction. Isolation to be achieved by 30 mm clear spacing between black and galvanized steel or denso tape on black steel at contact areas if 30 mm clear spacing cannot be achieved.
- .2 Provide full isolation gaskets (4 mm neoprene) between aluminum electrical shrouds and galvanized anchor bolts as shown on drawings.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing and Submissions requirements.

1.2 Reference Standards

- .1 ASTM A307-14e1, Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
- .2 CAN/CSA O80 Series-15, Wood Preservation.
- .3 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- .4 Copper naphthenate containing 2% copper for Brush or Spray Treatment for Field Cuts.
- .5 CSA O86-14, Engineering Design in Wood.
- .6 NLGA standard grading rules for Canadian Lumber 1980 edition or most recent at time of tendering.
- .7 ASTM D4637 / D4637M-15, EPDM Sheet Used in Single-Ply Roof Membrane.

1.3 Submissions

- .1 At least two (2) weeks prior to finalizing timber order, submit drawings, clearly indicating installation details.
- .2 Submit methodology for field treatment.
- .3 Provide submissions in accordance with Section 01 33 00.

1.4 Measurement for Payment

- .1 Timber will be measured in accordance with Section 01 29 00.

Part 2 PRODUCTS

2.1 Materials

- .1 Softwood Timber: Graded and stamped to National Lumber Grading Authority (NLGA) No. 1 Structural, Eastern Hemlock, Western Hemlock or Douglas Fir Species only will be used.
 - .2 Hardwood Timber: Sound merchantable grade yellow birch, hard maple, red or white oak conforming to grading rules approved by the National Hardwood Lumber Association.
 - .3 Provide treated hardwood shims as required to ensure full contact between sheathing, wales, and fender piles.
 - .4 Timber Treatment:
 - .1 Preservative treatment to CSA O80 Series-15 for Marine Construction Coastal Waters. Where assay retentions are not indicated, they are to be taken as 1.5 times the indicated gauge retention.
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- .2 Make arrangements for testing of timber by:
 - .1 Plant Inspection: Provide treatment plant identification, date of treatment, list of various pieces in the charge, charge number, plant assay testing results, concentration and type of preservative used, duration of treatment, gauge retention, species of wood; and make arrangements with the treatment plant to locate bundles, move bundles, break open bundles and carry out other measures to facilitate the inspection.
 - .2 Filling in and submitting a preprinted form, agreed to by the *Departmental Representative*, containing the above information.
- .5 Miscellaneous Hardware: Hardware must meet the following specifications:
 - .1 Machine bolts, lag bolts, drift bolts, anchor bolts, nuts, round plate washers: to ASTM A307.
 - .2 Hot dip galvanized hardware, bolts, nuts, washers and spikes to ASTM A123, with minimum zinc coating of 600 g/m².
 - .3 All hardware will be galvanized unless otherwise shown on plans.

Part 3 EXECUTION

3.1 General

- .1 Supply and install dimension timbers to details shown on drawings or as specified. Treated timber to be supplied in pre-cut lengths to suit. Install lag bolts in sound existing timber.
- .2 Boreholes for drift bolts to be 1.5mm smaller in diameter than bolt and for full length of bolt. Boreholes for machine bolts to be same diameter as bolts. Boreholes for lag bolts to be same diameter as shank for unthreaded portion and 0.70 times the shank diameter for the threaded portion. Threaded portion of lag bolts will be installed using a wrench, not by driving.
- .3 All countersunk holes to be recessed 25 mm and shall receive two coats of copper naphthenate, allowing sufficient time between applications to permit total absorption. The cost of supply and application of copper naphthenate will not be measured for payment but will be considered incidental to the work.

3.2 Handling Timber

- .1 Timber will be protected during handling, shipping, offloading and field handling, by use of suitable equipment and procedures. Use rope or fabric strap slings on site for moving bundles or individual timbers, rather than metal grabs, chains or cables.
- .2 Tops of vertical untreated timber to be field treated with minimum two liberal coats of copper naphthenate.

3.3 Handling Treated Timber

- .1 Handle treated material to avoid damage causing alteration in original treatment.
- .2 Treat in field, spike holes, boreholes, plugged holes, cuts and any damage to treated material, using Copper naphthenate, as specified herein, regardless of plant treatment type. Fill all unused bored holes and any other holes with tight fitting treated wooden plugs prior to any exposure to water containing marine borers.
- .3 Provide methodology pertaining to heating and application. Apply to dry surfaces wherever possible.
- .4 Treat boreholes, using a pressurized container with an extension rod, to produce a fine spray in the holes with one application. Alternately a cylindrical brush may be used.

- .5 Treat field cuts and any abrasions with minimum of two (2) liberal applications of approved preservative, using either spray or brush.
- .6 In addition, field cuts and underwater damaged areas will receive a coating of plastic compound, capped with lead flashing secured with galvanized roofing nails. Plastic compound not to be water soluble and is subject to approval.
- .7 Environmental Concern: Ensure no spillage or excess application of field preservative. Provide workmen with sufficient training and protective gear to handle the treated materials properly and safely and to apply field treatment, so as to prevent undue hazard to themselves, others, or the environment.
- .8 Contain all debris and leachates (films on water surface) within the area of the work by using containment facilities such as floating booms or screens.

3.4 Sheathing / Fender

- .1 Countersink bolts on exterior face of ladder.
- .2 Apply preservative to areas of unprotected wood exposed during course of work in accordance with Section 06 05 73.

END OF SECTION

Part 1 GENERAL

1.1 Related Work

- .1 Refer to other specification sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing/Submission requirements.

1.2 Submissions

- .1 Methodology:
 - .1 While requested provide methodology for carrying out the work
- .2 Provide submission in accordance with Section 01 33 00.

1.3 Protection

- .1 Prevent movement, settlement or damage of adjacent structures. Provide bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of *Departmental Representative* and at no additional cost to *Departmental Representative*.
- .2 Prevent debris from going adrift and becoming a menace to navigation.
- .3 All damage to existing structures, roadways, pipelines, electrical systems not specified for removal to be repaired at the Contractor's cost to the satisfaction of the *Departmental Representative*.

1.4 Measurement for Payment

- .1 Sitework, demolition and removals will be measured in accordance with Section 01 29 00.

Part 2 PRODUCTS

Not applicable.

Part 3 EXECUTION

3.1 Preparation

- .1 Inspect site and verify with *Departmental Representative* items designated for removal and items to be preserved.
- .2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.
- .3 Provide temporary power and lighting as shown on the plan or as required by the *Departmental Representative*.
- .4 Existing fill and vent pipes, oil waste tanks and underground storage tanks to be protected from any damages. All repairs to damages as a result of Contractor's operations to be at his cost and to the satisfaction of the *Departmental Representative*.

3.2 Removal

- .1 Remove items indicated.
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- .2 Do not disturb adjacent structures designated to remain in place.
- .3 At end of each day's work, leave work in safe condition so no part is in danger of toppling or falling.

3.3 Disposal of Material

- .1 Disposal of materials not designated for salvage or re-use in work, will be the contractor's responsibility, and must be disposed of off-site.
- .2 The material to be disposed is to be transported and disposed of in an environmentally acceptable manner to the satisfaction of the *Departmental Representative*, and in accordance with any local, Municipal, Provincial and Federal restrictions and regulations.

3.4 Restoration

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

END OF SECTION

Part 1 GENERAL

1.1 Description of Work

- .1 This section specifies requirements for the following items:
 - .1 Ladders including Holdfasts.
 - .2 Mooring Cleats.
 - .3 Vertical Ladder Extension.

1.2 Reference Standards

- .1 ASTM A307-21, Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
- .2 CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.
- .3 ASTM A123/A123M-17, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .4 ASTM A48/A48M-03(2016), Standard Specification for Gray Iron Castings.
- .5 CSA W59-18, Welded Steel Construction.
- .6 CSA W47.2-11 (R2014) – Certification of Companies for Fusion Welding of Aluminum.
- .7 CAN/CGSB-1.212-2004 – Heavy-Metal-Free Marine Primer for Steel and Light-Alloy Surfaces.
- .8 CAN/CGSB-1.61-2004 – Exterior and Interior Marine Alkyd Enamel.
- .9 CSA W47.1-19, Certification of Companies for Fusion Welding of Steel.
- .10 CSA W47.2-11 (R2020) – Certification of Companies for Fusion Welding of Aluminum.

1.3 Related Work

- .1 Refer to other Specification Sections for related information.
- .2 Refer to Section 01 33 00 for Submission and Shop Drawing requirements.
- .3 Section 05 50 00 – Metal Fabrications.
- .4 Section 06 05 73 – Dimension Timber.

1.4 Submissions

- .1 Shop Drawings:
 - .1 Clearly indicate the following items:
 - .1 General arrangements, dimensions, clearance locations and directions of assemblies as installed on structures.
 - .2 Locations, sizes and installation tolerances of anchor bolts, eye bolts and embedded parts.
 - .3 Types of materials used, finishes and core thickness.
 - .4 All other pertinent details and accessories.
 - .2 Product Data/Samples:

- .1 Provide product data and manufacturers brochures for the mooring holdfasts.
- .3 Test Results:
 - .1 Provide test results for the galvanized items.
- .4 Submissions
 - .1 Provide submissions in accordance with Section 01 33 00 – Submissions and Shop Drawings.

1.5 Measurement for Payment

- .1 Ladders, including timber, rungs, fasteners and holdfasts will be measured in accordance with Section 01 29 00.
- .2 Mooring holdfasts, including anchor bolts, shall be measured in accordance with Section 01 29 00.
- .3 Steel ladders for Berlin Wall panels, shall be measured in accordance with Section 01 29 00.

Part 2 PRODUCTS

2.1 Materials

- .1 Timber: Any timber supplied by Contractor must conform to Section 06 05 73 - Dimension Timber.
- .2 Chemical Anchor:
- .3 Hardware and miscellaneous items must meet the following specifications:
 - .1 Machine bolts, lag bolts, drift bolts, anchor bolts, nuts, washers to ASTM A307.
 - .2 Steel plates, ladder rungs, holdfasts and miscellaneous steel: to CSA G40.21, Grade 350W.
 - .3 Do not use items manufactured or fabricated from scrap steel of unknown chemical composition or physical properties.
 - .4 Hot dip galvanized bolts, anchor bolts, nuts, washers, pip sleeves, steel plates, rungs, holdfasts, U-bolts and any other miscellaneous steel to ASTM A123/A123M with minimum zinc coating of 610 g/m². All sharp corners, edges and weld splatter to be ground smooth prior to galvanizing.
 - .5 The material requirements for installation of light poles are given in the electrical sections/drawings.
 - .6 Weld quality and workmanship shall comply with CSA standard W47.1 and W59. Welders to be certified by Canadian Welding Bureau.

Part 3 EXECUTION

3.1 Ladders and ladder Extensions

- .1 Assemble ladder units and install completed units in locations shown on plan or as indicated by Departmental Representative.
- .2 Countersink bolts on exterior face of ladder.
- .3 Apply preservative to areas of unprotected wood exposed during course of work in accordance with Section 06 05 73.
- .4 Ladder upright shop drawing required.

3.2 Ladder Holdfasts

- .1 Install ladder holdfasts as shown on drawings.
- .2 Fasten to galvanized wheel guard with anchor bolts as shown on the drawings.
- .3 Do not make alternations to any components without written permission of Departmental Representative.

3.3 Mooring Cleats / Mooring Rings

- .1 Install mooring Cleats / Mooring Rings as shown on drawings.
- .2 Fasten to galvanized wheel guard with anchor bolts as shown on the drawings.
- .3 Do not make alternations to any components without written permission of *Departmental Representative*.

3.4 Installation General

- .1 Boreholes for drift bolts to be 1.5mm smaller in diameter than bolt and for full length of bolt. Boreholes for machine bolts to be same diameter as bolts. Boreholes for lag bolts to be same diameter as shank for unthreaded portion and 0.70 times the shank diameter for the threaded portion. Threaded portion of lag bolts will be installed using a wrench, not by driving.
- .2 Contain all debris and leachates (films on water surface) within the area of the work by using containment facilities such as floating booms or screens.

END OF SECTION