



Department of Fisheries and
Oceans

**Wharf 404
Replacement – Higgins
Shore – Prince Co., PEI**

**Technical
Specifications**

ISSUED FOR TENDER

October 2020

Project Number: 723274

WSP Project #: 201-00115-00

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- 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 Manufacturer's installation and application instructions.
- 1.2 Work Schedule and Completion Dates
- .1 Prepare and submit to the Departmental Representative within five (5) 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. Comply with the Dates of the Construction Schedule at all times. If, for any reason the Construction Schedule is not followed, immediately notify the Departmental Representative of the changes and submit a revised 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.
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- 1.3 Measurement Responsibilities
- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment purposes.
- 1.4 Contractor's Use of Site
- .1 Co-operate with users of existing facilities.
- .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.
- 1.5 Codes and Standards
- .1 Perform work in accordance with Canadian Highway Bridge Design Code (CHBDC) 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.
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- .3 Observe and enforce construction safety measures by Canadian Construction Safety Code and the Prince Edward Island Occupational Health and Safety Act. In the event of conflict between any provisions of above authorities, the most stringent provision will apply.
- 1.6 Project Meeting .1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
- 1.7 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 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. Establish all grades, lines, levels required to facilitate the work.
- 1.8 Existing Services .1 Where work involves breaking into or connecting to existing services, carry out work at times directed
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by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.

- .2 Before commencing work, establish location and extent of service lines in area of work and notify Department 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 the Departmental Representative and confirm findings in writing.

1.9 Contract Documents

- .1 Contract Drawings:
 - .1 The drawings listed in these "Plans and Specifications" marked S1 through S6 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 the "Short Form Type", for example, where the word
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"provide" occurs, interpret it to mean "the Contractor shall furnish all labour, material and equipment necessary to complete the work".

- .3 These Specifications 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.

1.10 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 "C".

1.11 Cutting, Fitting & 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 the Departmental Representative's approval before cutting, boring or sleeving, or excavating adjacent to load-bearing members.

1.12 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.

1.13 Payment

- .1 Payment for all work under this contract to be according to the "Articles of Agreement".
- .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 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.

1.14 Site
Examination

- .1 All parties tendering are highly recommended to 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.
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| 1.15 | <u>Maintenance of Shipping</u> | .1 | Liaise with the local port officials to coordinate activities such that any interference is minimized. |
| 1.16 | Cooperation and Assistance to Departmental <u>Representative</u> | .1 | Co-operate with Departmental Representative on inspection of work. |
| | | .2 | Provide assistance when requested. |
| | | .3 | Provide small motor boat with operator and sounding chain for Departmental Representative's use when requested. |
| 1.17 | <u>Datum</u> | .1 | The 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 work. |
| 1.18 | Contractor's <u>Representative</u> | .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' <u>Compensation</u> | .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 | | |
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| <u>Taxes and Fees</u> | .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 <u>Protection and Repair</u> | .1 | Repair any damage resulting from operations under this contract. |
| 1.22 <u>Location of Equipment Fixtures</u> | .1 | Location of equipment, fixtures or any and appurtenances indicated are to be considered approximate. |
| 1.23 <u>Inspection and Testing</u> | .1 | The Departmental Representative may employ an Inspector and/or Testing Company to ensure work conforms with contracts. |
| 1.24 <u>Disposal of Debris</u> | .1 | Dispose of debris, including construction materials not incorporated in the work, oil products and containers and other materials of this nature in suitable locations off the site. |
| | .2 | Material from the work will not be permitted to go adrift or otherwise become a menace to navigation. |
| 1.25 <u>Existing Soils Conditions</u> | .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 |
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other than those described by the boreholes themselves.

1.26 Relics and Antiquities

- .1 Protect relics, antiquities, items of historical or scientific 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 Departmental Representative's property.

1.28 Temporary Navigational Buoys

- .1 Maintain temporary navigation light to mark the position of the outer end of the structure as construction proceeds. Navigation light is to meet the requirements of Canadian Coast Guard Standard TP968 and be equipped with radar reflectors.
- .2 Contractor is to maintain temporary floating bouys at 30m intervals along the seaward face (maximum 10m offset) of the work area as construction proceeds. Navigation light shall be Go Deep International Inc GDI-0.25 bouy with internal radar reflector and M502 lantern, or approved equivalent. Place the yellow cautionary buoy farthest from the shoreward end of the wharf and 20m from ongoing construction. It must carry the following:
 - .1 Radar reflector.
 - .2 2nm amber light displaying characteristic (Fl) 4S from dusk to dawn and during periods of reduced visibility.
- .3 Coordinate the navigation light installation with the local Harbour Authority.
- .4 Contractor is responsible for all costs associated with the supply, installation and removal of all temporary navigation light.

1.29 Operations and
Maintenance Data

- .1 Submit Operations and Maintenance data in accordance with the requirements set forth in Section 01 33 00 – Submissions/Shop Drawing; Section 23 05 00 – Mechanical General Requirements; 26 05 00 – Common Work Results for Electrical and for any Section in these Specifications that require operation and maintenance data to be submitted.

-- 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 Waste Management Plan specified in Section 01 74 21;
 - .4 Health and Safety Plan specified in Section 01 35 29;
 - .5 Hot Work Procedures specified in Section 01 35 24;
 - .6 Lockout Procedures specified in Section 01 35 25.
- 1.2 Work Schedule
- .1 Upon acceptance of bid, submit:
 - .1 Detailed Work Schedule submitted within seven (7) calendar 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.
 - .4 Work Schedule content to include as a minimum, the following:
 - .1 Bar (GANNT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;
 - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project
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- within designated time;
- .3 Generally, bar charts derived from commercially available computerized project management systems are preferred, but not mandatory.
- .5 Work Schedule must take into consideration and reflect the work phasing, and operational restrictions as indicated on drawings.
- .6 Schedule work in cooperation with the Departmental Representative. Incorporate within Work Schedule, items identified by Departmental Representative during review of schedule.
- .7 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.
- .8 Ensure that all sub-trades and sub- contractors are made aware of the work restraints and operational restrictions specified.
- .9 Schedule Update:
- .1 Submit when requested 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.
- .10 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 corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.
- .11 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.
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- 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.
 - .2 Maintain those areas clean and free of construction materials and equipment.
- 1.4 Project Meetings
- .1 Project meetings will be scheduled and administered by the Departmental Representative, held on a minimum bi-weekly basis, for the entire duration of work or more often when directed by Departmental Representative as deemed necessary due to progress of work or particular situation.
 - .2 The Departmental Representative will prepare the agenda for meetings.
 - .3 The Departmental Representative will notify participants in writing four (4) working days in advance of the meeting date.
 - .1 Ensure attendance of all sub-contractors.
 - .2 Departmental Representative will provide list of other attendees to be notified.
 - .4 Meetings will be held at project site unless otherwise approved by the Departmental Representative.
 - .5 The Departmental Representative will preside at meetings and record minutes.
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- .1 Indicate significant proceedings and decisions. Identify action items by parties.
 - .2 Distribute to participants by mail or by facsimile within three (3) working days after each meeting.
 - .6 All proposed revisions to the meeting minutes must be received within three (3) working days of distribution.
 - .1 Departmental Representative will advise whether proposed revision of minutes is acceptable. Decision will be based on compatibility of software among participants.
- 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 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once a coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.
 - .3 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 and the need to remove and replace completed work.
 - .4 No extra costs to the Contract will be considered by the Departmental Representative as a result of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor to be resolved

at his own cost.

- 1.6 Other Contacts
- .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 - GENERAL

- 1.1 Description
- .1 Mobilization and Demobilization consists of preparatory work and operations including, but not limited to, those necessary for the movements of personnel, equipment, supplies, and incidentals to and from the project sites.
 - .2 For those purposes of mobilization and demobilization, "project site" means the location.
- 1.2 Measurement For Payment
- .1 See Section 01 29 00 – Project Particulars and Measurements

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Description of Work
- .1 The work includes, but is not limited to:
 - .1 Demolition and removals.
 - .2 Construction of new steel pile wharf with timber beams and deck.
 - .3 Construction of a timber pile fender system.
 - .4 Supply and installation of curbs, ladders and other miscellaneous hardware.

PART 2 - PRODUCT MEASUREMENT

- 1.2 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.
- 1.3 Measurement for Payment
- .1 **Lump Sum Items: the following items (1 and 2) are to measured separately for costing purposes, then combined and submitted in as one item under the Lump Sum items in the tender documents:**
 - .1 Site Work, Demolition and Removals: This item includes all work required to demolish and remove the existing wharf structures as indicated on the drawings. This item also includes all site excavation. Provide a temporary benchmark based on the existing benchmark located on site. This item will also include disposal of all refuse and waste at the appropriate facilities in accordance with Section 01 74 21. Payment for this item will require proof of proper timber disposal in the form of a receipt from an approved disposal facility.
 - .2 Mobilization/Demobilization: This item includes all Work required to get the Contractor's equipment and forces on-site. This item also includes all Work required for the Contractor's forces and equipment to leave the site, including the final clean-up of

the site to the Departmental Representative's satisfaction. This item also includes all provisions for the Contractor's site office with all amenities as specified by the Contract Documents. This item also includes the disassembly and removal of the site office at the time of completion of the Works.

- .2 **Unit Price Items: the following outlines the unit of measurement of the unit price items as indicated in the tender documents:**

Division 03

- .1 **Reinforced Concrete Pile Caps:** Cast-in-place reinforced concrete pile caps will be measured by the cubic metre based on the dimensions indicated on the drawings. Concrete pile caps placed beyond the dimensions shown will not be measured. Concrete formwork, reinforcement, anchor bolts, and all supplementary materials will be considered incidental to the work.

Division 05:

- .1 **Miscellaneous Steel:** Miscellaneous steel will be measured for payment in kilograms (kg). Calculations will be based on the dimensions indicated on the drawings. This work shall include the fabrication, supply, galvanizing, delivery and installation of all steel angles and plates. All material waste, storage and handling requirements, and all coating touch ups will be considered incidental to this work.
2. **Ladders:** Ladders, including holdfasts, rungs and fastenings, will be measured for payment per each. Bolts, hardware, and galvanized finishes will not be measured, but considered incidental to the work. Timber fenders shall not be considered part of this work.
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- .3 Mooring Cleats: Mooring cleats will be measured for payment per each. Bolts, hardware and finishes will not be measured, but considered incidental to the work.

Division 06

- .1 Dimension Timber: Dimension timber will be measured for payment by the cubic metre. Calculations will be based on the timber dimensions indicated on the drawings. This Work shall include timber beams, timber deck, timber fenders and extended fenders, longitudinal and transverse wales, timber curbs and timber curb blocking. Installation of bolts and hardware will not be measured, but considered incidental to the work. All timber cut-off waste shall be considered incidental to the work.

Division 31:

- .1 Excavation: Disposal of excavated material will be measured for payment by the tonne. This item shall include hauling the material to a Provincially approved Facility. Payment for this item will require proof of proper disposal in the form of a receipt from an approved disposal facility.
- .2 Backfill – Select Borrow: Backfill – Select Borrow will be measured for payment by the tonne. Calculations will be based on the theoretical limits shown on the drawings. This item shall include the supply, delivery, and installation of borrow material.
- .3 Rip Rap: Rip Rap will be measured for payment by the tonne. This item shall include the supply and installation as shown on the drawings. All shipping, handling, and placement shall be considered incidental to this work. No additional payment will be considered for removing and replacing non-compliant materials.
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- .4 Geotextile: Geotextile will be measured for payment by the square metre. This item shall include the supply and installation as shown on the drawings. Overlap requirements, all installation hardware, material waste, and waste disposal shall be considered incidental to this work.
- .5 Sheet Steel Piling: Steel sheet piling will be measured for payment by the square metre place measure. All cutting requirements and cutoff waste will be considered incidental to the work. No additional payment shall be considered for re-driving sheet piles which exceed the tolerances described in Specification 31 62 16.13.
- .6 Supply of Steel Piles: Supply of steel piles will be measured for payment per lineal metre place measure. All cutoff waste shall be considered incidental to the work.
- .7 Installation of Steel Piles: The installation of steel piles will be measured for payment per metre place measure. All pile shoes, hardware, supply and installation of pile caps, and re-striking requirements will be considered incidental to the Work. No additional payment shall be considered for re-driving piles which exceed the tolerances described in Specification 31 61 18.

Division 32:

- .1 Class A Base Course: Class A Base course will be measured for payment by the tonne. Calculations will be based on the theoretical limits shown on the drawings. This item shall include the supply, delivery, and installation of gravel material.
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- .2 Hot Mix Asphalt: Hot Mix Asphalt will be measured for payment by the square metre. Calculations will be based on the theoretical limits shown on the drawings. This item shall include the supply, delivery, and installation of asphalt material.

-- END OF SECTION --

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| 1.1 | <u>Related Requirements</u> | .1 | Particular requirements for inspection and testing to be carried out by testing laboratory are specified under various sections. |
| 1.2 | <u>Appointment and Payment</u> | .1 | The Departmental Representative will appoint and pay for the services of testing laboratory, except for the following: <ul style="list-style-type: none">.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 Tests specified to be carried out by Contractor under the supervision of Departmental Representative..4 Tests requested by Departmental Representative to confirm material specifications when the applicable manufacturer's documentation or test results are unavailable..5 Additional tests specified in paragraph 1.2.2. |
| | | .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 may be required to verify acceptability of corrected work. |
| 1.3 | <u>Contractor's Responsibilities</u> | .1 | Furnish labour and facilities to: <ul style="list-style-type: none">.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 tests. |
| | | .3 | Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory. |
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- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and accepted by Departmental Representative.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 35 24 - Special Procedures on Fire Safety Requirements
 - .2 Section 01 35 29 - Health and Safety Requirements
 - .3 Section 01 78 00 - Closeout Submittals
 - .4 Section 03 10 00 - Concrete Forming and Accessories
 - .5 Section 03 20 00 - Concrete Reinforcing
 - .5 Section 03 30 00 - Cast-in-Place Concrete
 - .6 Section 05 50 00 - Metal Fabrications
 - .7 Section 06 05 73 - Dimension Timber
 - .8 Section 31 62 19 – Steel H-Piles
- 1.2 Administrative
- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
 - .2 Do not proceed with Work affected by submittal until review is complete.
 - .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
 - .4 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract
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Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors, deviations or omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Submittal format: paper originals, or alternatively clear and fully legible photocopies of originals. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.
- .10 Make changes or revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, identify in writing of any revisions other than those requested.
- .11 Keep one reviewed copy of each submission on site.

1.3 Shop Drawings
and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
 - .2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in the Province of Prince Edward Island, Canada.
 - .3 Shop Drawing Submittal Schedule:
 - .1 Submit, within 10 working days of contract award, in format acceptable to Departmental Representative, a submittal schedule listing all
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- shop drawings to be submitted for project as specified in various sections of the specifications.
- .2 Schedule to indicate proposed submission date for each item, status of review and anticipated product delivery date to site. Track all submissions for entire project.
 - .3 As work progresses, revise schedule identifying items which have been reviewed and finalized and indicating those outstanding.
 - .4 Update schedule at stipulated dates or project time intervals predetermined and agreed upon with Departmental Representative at commencement of work.
- .4 Shop Drawing Quantities: submit sufficient copies required by the General Contractor and sub-contractors, plus 3 copies which will be retained by Departmental Representative.
- .5 Shop Drawings Format:
- .1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.
 - .2 Product data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.
 - .3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.
- .6 Shop Drawings Content:
- .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.
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- .7 Allow 14 days for Departmental Representative's review of each submission.
 - .8 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .9 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
 - .10 Be advised that costs and expenses incurred by Departmental Representative to conduct more than one review of incorrectly prepared shop drawing submittal for a particular material, equipment or component of work may be assessed against the Contractor in the form of a financial holdback to the Contract.
 - .11 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .12 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
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- .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.

 - .13 After Departmental Representative's review, distribute copies.

 - .14 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

 - .15 The review of shop drawings by the Department of Fisheries and Oceans (DFO) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that DFO approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.
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1.4 Samples

- .1 Submit for review samples as specified in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples Departmental Representative's office or to other address as directed. Do not drop off samples at construction site, except for pre-approved circumstances previously approved by Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Work .1 Section 01 35 29 - Health and Safety Requirements.
- 1.2 References .1 Fire Protection Standards issued by Fire Protection Services of Human Resources Development Canada as follows:
.1 FCC No. 301-June 1982 Standard for Construction Operations (or latest edition).
.2 FCC No. 302-June 1982 Standard for Welding and Cutting (or latest edition).
.3 FCC Standards may be viewed at the Regional Fire Protection Services' office (previously known as the Fire Commissioner of Canada) located at 99 Wyse Road, 8th Floor, Dartmouth, NS, Tel: (902) 426-6053.
- 1.3 Definitions .1 Hot Work defined as:
.1 Welding work;
.2 Cutting of materials by use of torch or other open flame devices;
.3 Grinding with equipment which produces sparks;
.4 Use of open flame torches.
- 1.4 Submittals .1 Submit copy of Hot Work Procedures and samples of Hot Work permit to Departmental Representative for review, within 14 calendar days after contract award.
.2 Submit in accordance with Section 01 33 00.
- 1.5 Fire Safety Requirements .1 Implement and follow fire safety measures during Work. Comply with the following:
.1 National Fire Code;
.2 Fire Protection Standards FCC 301 and FCC 302;
.3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
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- .2 In the 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.
- 1.6 Hot Work Authorization
- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization, submit to Departmental Representative:
- .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
- .2 Description of the type and frequency of Hot Work required.
- .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented 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.
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- 1.7 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 written permit issued by Contractor's Superintendent to specific worker or subcontractor granting permission to proceed with Hot Work.
 - .3 Permit required for each Hot Work event.
 - .4 Designation of a 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.
 - .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.
 - .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification as specified in Section 01 35 29.
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- 1.8 Hot Work
Permit
- .1 Hot Work Permit to include the following:
 - .1 Project name and project number;
 - .2 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, and 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 type written 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.
- 1.9 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 fire fighting.
 - .3 Costs incurred from the fire department and 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.
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- 1.10 Documents
On Site
- .1 Upon request, make available to Departmental Representative or to authorized safety representative for inspection.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Work Included .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
- .2 Section 01 35 24: Special Procedures in Fire Safety Requirements
- 1.3 References .1 CSA C22.1-15, Canadian electrical code, part I (22nd edition), safety standard for electrical installations.
- .2 CAN/CSA-C22.3 NO. 1-15, Overhead systems.
- .3 CAN/CSA-C22.3 NO. 7-15, 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
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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 Perform lockouts in compliance with:
.1 Canadian Electrical Code
.2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 30.
.3 Regulations and code of practise as applicable to mechanical equipment or other machinery being de-energized.
.4 Procedures specified herein.

.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.

.3 Coordination with electric power utility.

1.6 Submittals

.1 Submit copy of proposed Lockout Procedures and sample form of lockout permit and lockout tags for review.

.2 Submit documentation within 14 calendar days of contract award. Do not proceed with work until submittal has been reviewed by Departmental Representative.

- .3 Submit above documents in accordance with the submittal - general requirements specified in section 01 33 00.
 - .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.
- 1.7 Isolation of Existing Services
- .1 Obtain Departmental Representative's written authorization prior to conducting work on an existing active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.
 - .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 Document to be in typewritten format.
 - .5 Do not proceed until receipt of written notification from Departmental Representative granting the Isolation Request and authorizing to proceed with the isolation of designated equipment or facility.
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Departmental Representative may designate other individual at the Facility as the person authorized to grant the Isolation Request.

- .6 Conduct safe, orderly shut down of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.
- .7 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.
- .8 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow Departmental Representative's directives in this regard.
- .9 Conduct hazard assessment as part of the planning process of isolating existing equipment and facilities. Hazard Assessments to conform to requirements of Health and Safety Section 01 35 29.

1.8 Lockouts

- .1 Isolate and lockout electrical facilities, mechanical equipment and machinery from all potential energy sources prior to starting work on such items.
- .2 Develop and implement lockout procedures to be followed on site as an integral part of the Work.
- .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .4 Use industry standard lockout tags.
- .5 Provide appropriate safety grounding and guards as required.
- .6 Prepare Lockout Procedures in writing. Describe safe work practices, work functions and sequence of activities to be followed on site to safely isolate all

potential energy sources and lockout/tagout facilities and equipment.

- .7 Include within procedures a system of worker request and issuance of individual lockout permit by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
 - .1 Controlling issuance of permits or tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Submitting a Request for Isolation to Departmental Representative when required in accordance with Clause 1.7 above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Confirming equipment or facility has been properly isolated, providing a Guarantee of Isolation to worker(s) prior to proceeding with work.
 - .7 Collecting and safekeeping lockout tags, returned by workers, as a record of the event.
 - .8 Clearly establish, describe and allocate, within procedures, the responsibilities of:
 - .1 Workers.
 - .2 Designated person controlling issuance of lockout tags/permits.
 - .3 Safety Watcher.
 - .4 Subcontractors and General Contractor.
 - .9 Procedures must meet the requirements of Codes and Regulations specified in clause 1.5 above.
 - .10 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the procedures applicable to this contract.
 - .1 Incorporate site-specific rules and procedures established by Facility Manager and in force at site. Obtain such procedures through Departmental Representative.
 - .11 Provide procedures in typewritten format.

.12 Submit a copy of Lockout Procedures to Departmental Representative, in accordance with submittal requirements of clause 1.6 herein, prior to commencement of work.

1.9 Conformance

- .1 Ensure that lockout procedures, as established for project on site, are stringently followed. Enforce use and compliance by all workers.
- .2 Brief all persons working on electrical facilities, mechanical and other equipment fed by an energy source on requirements of this section.
- .3 Failure to perform lockouts in accordance with regulatory requirements or follow procedures specified herein may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in section 01 35 29.

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 submitted to Departmental Representative and lockout permits or tags issued to workers during the course of work for full project duration.
- .3 Upon request, make such data available to Departmental Representative or to authorized safety representative for inspection.

PART 2 – PRODUCTS

Not applicable

PART 3 – EXECUTION

Not applicable

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .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 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
 - .2 Competent Person: means a person who is:
 - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
 - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work, and;
 - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
 - .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
 - .4 PPE: personal protective equipment including measures for protection against COVID-19.
 - .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.
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- 1.3 Submittals
- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
 - .1 Submit within 15 work days of notification of Bid Acceptance. Allow for 5-10 days for Department to review and recommendations prior to the commencement of the work. Provide three (3) copies.
 - .2 Departmental Representative will review Health and Safety Plan and provide comments.
 - .3 Revise the Plan as appropriate and resubmit within 5 work days 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.
 - .6 Contractor to submit a site-specific Health and Safety Plan prior to commencement of Work. Contractor will be required to include Health and Safety Requirements to protect their workers and the project site including precautions and mitigation related to the hazard of contracting or spreading COVID-19. A source of advice can be found in the Canadian Construction Association COVID-19 Standardized Protocols for All Canadian Construction Sites.
 - .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
 - .4 Submit Building Permit, compliance certificates and other permits obtained.
 - .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
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- .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
 - .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
 - .7 Submit copies of incident reports.
 - .8 Submit WHMIS MSDS - Material Safety Data Sheets.
- 1.4 Compliance Requirements
- .1 Comply with Occupational Health and Safety Act for Province of Nova Scotia, and Regulations made pursuant to the Act.
 - .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH), as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at: [www.http://laws-lois.justice.gc.ca/eng/acts/L_2_fulltest.html](http://laws-lois.justice.gc.ca/eng/acts/L_2_fulltest.html).
 - .2 Canadian Occupational Health and Safety Regulations can be viewed at: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html>
 - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada, Ottawa, Ontario, K1A 0S9 Tel: (819)956-4800 (1-800-635-7943) Publication No. L31-85/2000 (E or F).
 - .3 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010 - www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316§ion=text.
 - .4 Observe construction safety measures of:
 - .1 NBC 2010, Division B, Part 8.
 - .2 Municipal by-laws and ordinances.
 - .5 In case of conflict or discrepancy between above
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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
- .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 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
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- 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.
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- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
 - .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. Provide security guard where adequate protection cannot be achieved by other means.
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- 1.7 Protection
- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
 - .2 Should unforeseen or peculiar safety related 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.
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- 1.8 Filing of Notice
- .1 File Notice of Project with pertinent Provincial health and safety authorities prior to beginning of Work.
 - .1 Departmental Representative will assist in locating address if needed.
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- 1.9 Permits
- .1 Post permits, licenses and compliance certificates, specified in section 01 10 10 - General Instructions, at Work Site.
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- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.
 - 1.10 Hazard Assessment
 - .1 Perform site specific health and safety hazard assessment of the work and its site.
 - .2 Carry out initial assessment prior to commencement of work with further assessments as needed during progress of work, including when new trades and sub-contractors arrive on site.
 - .3 Record results and address in Health and Safety Plan.
 - .4 Keep documentation on site for entire duration of the work.
 - 1.11 Project/Site Conditions
 - .1 Following are potential health, environmental and safety hazards at the site for which work may involve contact with:
 - .1 Facility ongoing operations:
 - .1 Commercial fishing and related activities
 - .2 Marine environment
 - .3 Overhead power lines
 - .4 Temperate working environment
 - .5 Working in close proximity to water
 - .6 Slip and tripping hazards due to uneven surfaces
 - .7 Stability of existing wharf and walkway structures
 - .8 Tide fluctuations
 - .2 Covid-19 measures to protect contractor, employees, consultants, Departmental Representative, and harbor users. Update these measures as required. Discuss any concerns throughout the contract with the Departmental Representative.
 - .1 Include measures put in place for physical distancing to and from site, during breaks, lunch, supper and hotels.
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- .3 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during work.
 - .4 Include above items in the hazard assessment of the work.
 - .5 MSDS data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.
- 1.12 Meetings
- .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 regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety Regulations.
 - .3 Keep documents on site.
- 1.13 Health and Safety Plan
- .1 Prior to commencement of work, develop written 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 Health and Safety Plan shall include the following components:
 - .1 List of health risks and safety hazards identified by hazard assessment.
 - .2 Control measures used to mitigate risks and hazards identified.
 - .3 On-site Contingency and Emergency Response Plan as specified below.
 - .4 On-Site Communication Plan as specified below.
 - .5 Name of Contractor's designated Health & Safety Site Representative and information showing
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- proof of his/her competence and reporting relationship in Contractor's company.
- .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-Site Contingency and Emergency Response Plan shall include:
- .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
- .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, locations of firefighting equipment and other related data.
- .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
- .4 Emergency Contacts: name and telephone number of officials from:
- .1 General Contractor and sub-contractors.
- .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
- .3 Local emergency resource organizations.
- .5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of DFO and Facility Management contacts.
- .4 On-site Communication Plan:
- .1 Procedures for sharing of work related safety information to workers and sub-contractors, including emergency and evacuation measures.
- .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.
- .5 Address all activities of the work including those of sub-contractors.
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- .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or sub-contractor arrive at work site.
 - .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
 - .8 Post copy of the Plan, and updates, prominently on Work Site.
- 1.14 Safety Supervision
- .1 Employ Health and 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.
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- .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.
 - .6 Cooperate with Facility's Occupational Health and Safety Representative should be one designated by Departmental Representative.
 - .7 Keep inspection reports and supervision related documentation on site.
 - 1.15 Training
 - .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
 - .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
 - .3 When unforeseen or peculiar safety-related hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
 - 1.16 Minimum Site Safety Rules
 - .1 Notwithstanding requirement to abide by Federal and Provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
 - .1 Wear appropriate PPE pertinent to the Work or assigned footwear, safety glasses and hearing protection.
 - .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
 - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
 - .4 Obey warning signs and safety tags.
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- .2 Brief persons of disciplinary protocols to be taken for non-compliance. Post rules on site.

 - 1.17 Correction of Non-Compliance
 - .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
 - .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 Departmental Representative 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 the following incidents to Departmental Representative:
 - .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agencies.
 - .2 Medical aid injuries.
 - .3 Property damage in excess of \$10,000.00.
 - .4 Interruptions to Facility operations resulting in an operational loss to a Federal department in excess of \$5,000.00.
 - .2 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 the 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.
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| 1.21 | <u>Power Actuated
Devices</u> | .1 | Use powder actuated fastening devices only after receipt of written permission from Departmental Representative. |
| 1.22 | <u>Confined
Spaces</u> | .1 | Abide by Occupational Health and Safety Regulations regarding work in confined spaces. |
| 1.23 | <u>Site Records</u> | .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 | <u>Posting of
Documents</u> | .1 | Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction. |
| | | .2 | Post other documents as specified herein, including:
.1 Site specific Health and Safety Plan.
.2 WHMIS data sheets. |

-- END OF SECTION --

1.1 References

- .1 Canada Shipping Act, Transport Canada, 2001, amended 2013-12-01.
- .2 Canadian Coast Guard Regulations, Fisheries and Oceans Canada.
- .3 Canadian Environmental Assessment Act, 2012, amended 2013-11-25.
- .4 Canadian Environmental Protection Act, 1999, amended on 2014-03-28.
- .5 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2013-11-25.
- .6 Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters, 1998.
- .7 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10.
- .8 Navigation Protection Act, 1985. Transport Canada, amended 2014-04-01.
- .9 Prince Edward Island – Environmental Protection Act.
- .10 Species at Risk Act, 2002, amended 2013-03-08.
- .11 The Federal Policy on Wetland Conservation, 1991, Environment Canada.
- .12 Transportation of Dangerous Goods Act, 1992, Transport Canada, amended 2009-06-16.
- .13 Workplace Hazardous Materials Information System, Health Canada.

1.2 Definitions

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

- .2 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.
- .3 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.
- .4 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.
- .5 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.

1.3 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 Maintain trucks clean and free of mud, dirt and other foreign matter.
- .4 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 material and other hazardous materials. Immediately clean any spillage and soils.

- .5 Before commencement of work, advise the 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.
- .6 Vessels must be permitted safe access through the worksite at all times, and shall be assisted as necessary.
- .7 All materials and equipment used in construction must be marked in accordance with the Collision Regulations of the Canadian Shipping Act, 2001 when located on the waterway.

1.4 Operation of Machinery

- .1 Confirm 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.

1.5 Containment and Spill Management

- .1 Comply with Federal and Provincial laws, regulations, codes, standards 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 metre buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30 metre buffer zone. Obtain approval from Departmental Representative of acceptable location on site for fuel storage and equipment service.

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- .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 vehicles and equipment in good working order to prevent leaks on site.
 - .6 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.
- 1.6 Hazardous Material Handling
- .1 Store and handle hazardous materials in accordance with applicable federal and provincial regulations, codes, standards and guidelines. Store in location that will prevent spillage into the environment.
 - .2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
 - .3 Maintain written inventory of all hazardous materials kept on site. List product name, quantity and storage date.
 - .4 Store and handle flammable and combustible materials in accordance with National Fire Code.
- 1.7 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 Provincial Waste Management requirements.
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- .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.
- 1.8 Water Quality
- .1 Conduct visual monitoring for suspended solids daily during periods of in-water works, and other related works. If any changes occur in the turbidity of the water in the vicinity of the work area as a result of construction activities, the work should immediately stop and the Department of Fisheries and Oceans – Fisheries Protection Program contacted at (902) 426-3909 to determine if additional mitigation measures are required.
 - .2 Where work may affect the water quality adjacent to water intake lines used by lobster holding facilities, fish processing facilities and other harbor users, schedule work in cooperation with the Harbour Authority as directed by the Departmental Representative to minimize interference and impact to harbour users.
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- .3 Do not wash down equipment within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.

 - .4 Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the water body during all phases of the work. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the water body or settling basin and runoff water is clear. The plan should, where applicable, include:
 - .1 Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - .2 Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a water body. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.
 - .3 Site isolation measure (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., excavation, dredging, underwater cable installation).
 - .4 Measures for containing and stabilizing waste material (e.g., excavated material, dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby water bodies to prevent re-entry.
 - .5 Regular inspection and maintenance of erosion and sediment control measures and structures during the course of the work.
 - .6 Repairs to erosion and sediment control measures and structures if damage occurs.
 - .7 Removal of non-biodegradable erosion and sediment control materials once site is stabilized.
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- .5 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.

 - 1.9 Socioeconomic Restrictions
 - .1 Abide by municipal and provincial regulations for any restrictions on work performed during the night time and on flood lighting of the site. Obtain applicable permits.
 - .2 Place flood lights in opposite direction of adjacent residential and business areas.
 - .3 Use work equipment and machinery with purposely designed mufflers to reduce noise on site to lowest possible level. Maintain mufflers in good operating condition at all times.

 - 1.10 Bird 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.
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- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .4 During night time 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 in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.11 Fish and
Fish Habitat

- .1 Avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- .2 Confirm 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 as a result 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.
 - .1 Equipment shall include boats, barges, cranes, excavators, haul trucks, pumps, pipe lines 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 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 the 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 washdown within a 30 metre 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 washdowns of all equipment to illustrate mitigation measures undertaken
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- against fish habitat contamination by alien species.
 - .2 Write data in a hard cover bound logbook,
 - .3 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 washdown 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 Environment Canada and the Department of Fisheries and Oceans – Oceans and Habitat Branch in cleaning and wash down of equipment.
- 1.12 Air Quality
- .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
 - .2 Employ dust suppression by the application of water when required. Apply dust control measures to roads, parking lots and work areas. The Departmental Representative will determine locations where water is to be applied and the times at which is to be applied. Waste oil must not be used for dust control under any circumstances.
 - .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.
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- 1.13 Fires .1 Fires and burning of rubbish on site is not permitted.
- 1.14 Archaeological .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 his/her immediate supervisor.
- .2 If an archaeological and/or historically significant item is discovered during excavation, work in the area will be stopped immediately and the Departmental Representative.
- .3 Work can only resume in the vicinity of the find when authorized by the DFO Project Manager and Construction Supervisor, after approval has been granted by the Prince Edward Island Department of Environment, Water, and Climate Change.
- .4 In the event of the discovery of human remains or evidence of burials, the excavation work will immediately cease and nearest law enforcement agency will be contacted immediately by the DFO Project Manager and/or the Construction Supervisor.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 03 20 00 - Concrete Reinforcing
 - .2 Section 03 30 00 - Cast-in-Place Concrete
 - .3 Section 31 62 18 – Steel H-Piles
- 1.2 Inspection
- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
 - .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
 - .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
 - .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- 1.3 Independent Inspection Agencies
- .1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
 - .2 Provide equipment required for executing inspection and testing by appointed agencies.
 - .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
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- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.
- 1.4 Access to Work
- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.
- 1.5 Procedures
- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.
- 1.6 Rejected Work
- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- 1.7 Reports
- .1 Submit 3 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to manufacturer or fabricator of material being inspected or tested.
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1.8 Mill Tests .1 Submit mill test certificates as required of specification Sections.

PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 02 41 16.01 - Structure Demolition and Sitework.
- 1.2 Site Access and Parking .1 Parking facilities at site are limited. Arrange for parking and storage with Departmental Representative and Harbour Authority Representative.
- .2 Maintain new and existing roads and parking areas at site, where used by Contractor, for duration of contract.
- .1 Keep clean and free of mud and dirt by washing on a regular basis.
- .2 Provide snow removal in areas located within construction site or enclosed by work.
- .3 Make good and repair damage resulting from Contractor's use of existing roads, asphalted areas and lawns on site.
- 1.3 Contractor's Site Office .1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative and Harbour Authority Representative.
- .2 Provide all required facilities and shelter by legislation or code for use of workers and Departmental Representative and/or their identified field staff.
- 1.5 Material Storage .1 Arrange for and locate site storage trailers in location of least interference with existing facility operations. Discuss with Departmental Representative and Harbour Authority Representative.
- .2 Material storage space on site is limited.
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| 1.6 | <u>Sanitary
Facilities</u> | .1 | Provide sanitary facilities for workforce 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. |
| | | | |
| 1.7 | <u>Power</u> | .1 | Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances. |
| | | .2 | Supply and install all temporary facilities for power such as pole lines, meter socket, underground cables, etc., as required and to approval of local power supply authority. |
| | | | |
| 1.8 | <u>Water Supply</u> | .1 | Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances. |
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| 1.9 | <u>Removal of
Temporary
Facilities</u> | .1 | Remove temporary facilities from site when directed by Departmental Representative. |

-- END OF SECTION --

PART 1 – GENERAL

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| 1.1 | <u>Installation and Removal</u> | .1 | Provide temporary controls in order to execute Work expeditiously. |
| | | .2 | Remove from site all such work after use. |
| 1.2 | <u>Guard Rails and Barricades</u> | .1 | Provide secure, rigid guard rails and barricades around deep excavations. |
| | | .2 | Provide concrete jersey barriers as required to provide a secure and safe workplace. |
| 1.3 | <u>Access to Site</u> | .1 | Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work. |
| 1.4 | <u>Public Traffic Flow</u> | .1 | Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public and harbour users. |
| 1.5 | <u>Fire Routes</u> | .1 | Maintain access to property including overhead clearances for use by emergency response vehicles. |
| 1.6 | <u>Protection for Off-Site and Public Property</u> | .1 | Protect surrounding private and public property from damage during performance of Work. |
| | | .2 | Be responsible for damage incurred. |
| 1.7 | <u>Waste Management and Disposal</u> | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |
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PART 2 - PRODUCTS

- 2.1 Materials
- .1 Barricades and Buoys:
 - .1 All pedestrian or vehicular or vessel traffic control devices required by Municipal Regulations, as interpreted by the Municipal Authority, or other Authority having jurisdiction, to safely direct and/or control all traffic in the areas of construction.
 - .2 All pedestrian, vehicular or vessel traffic control devices as required to safely direct and/or control all traffic in the areas of construction on the wharf and as directed by the Departmental Representative.

PART 3 - EXECUTION

- 3.1 Installation
- .1 Erect temporary barricades and buoys as directed and where required before any construction work takes place.
 - .2 Barricades and buoys to remain in place and be maintained by Contractor during entire construction period, except as noted in Par. 3.2.1 below.
- 3.2 Removal
- .1 Barricades and buoys may be removed in areas of work where all site work restitution is completed and the area has been accepted by the Owner and by the Departmental Representative.
 - .2 Upon total completion of work, neatly stockpile all existing concrete jersey barriers on site as directed by the Departmental Representative.

-- END OF SECTION --

- 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 123 unless otherwise noted.
- 1.4 Delivery and Storage
- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seal and labels intact.
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- .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 and Storage 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.
 - .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.
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- .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 Owner 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.
- 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 Related Sections .1 Section 01 77 00 - Closeout Procedures
- 1.2 General .1 Conduct cleaning and disposal operations to comply with local ordinances, Harbour Authority and anti-pollution laws.
- .2 Sort volatile waste in covered metal containers, and remove from premises at end of each working day.
- 1.3 Project Cleanliness .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Provide on-site containers for collection of waste materials and debris.
- .4 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .6 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
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- .8 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- 1.4 Final Cleaning
- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .5 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .6 Remove dirt and other disfiguration from exterior surfaces.
- .7 Sweep and wash clean paved areas.
- .8 Reinstate any areas damaged by work.
- 1.5 Waste Management and Disposal
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Work
- .1 Section 01 35 44 - Environmental Protection Procedures for Marine Work
 - .2 Section 01 56 00 - Temporary Barriers and Enclosures
 - .3 Section 01 74 11 - Cleaning
 - .4 Section 01 77 00 - Closeout Procedures
 - .5 Section 02 41 16.01 - Structure Demolition
 - .6 Section 03 10 00 - Concrete Forming and Accessories
 - .7 Section 03 20 00 - Concrete Reinforcing
 - .8 Section 03 30 00 - Cast-in-Place Concrete
 - .9 Section 05 50 00 - Metal Fabrications
 - .10 Section 06 05 73 - Dimension Timber
 - .11 Section 31 61 13 - Pile Foundations, General Requirements
 - .12 Section 31 62 18 – Steel H-Piles
- 1.2 General
- .1 Carry out work placing maximum emphasis on the areas of:
 - .1 Waste reduction;
 - .2 Diversion of waste from landfill, and;
 - .3 Material recycling.
- 1.3 Waste Management Plan
- .1 Prior to commencement of work, prepare Waste Management Workplan.
 - .2 Workplan to include:
 - .1 Waste reduction practices;
 - .2 Material source separation process;
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- .3 Procedures for sending recyclables to recycling facility;
 - .4 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
 - .5 Training and supervising workforce on waste management at site.
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- .3 Workplan to incorporate waste management requirements specified herein and in other sections of the specifications.
 - .4 Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.
 - .5 Submit copy of Workplan to Departmental Representative for review.
 - .1 Make revisions to Plan as directed by Departmental Representatives.
 - .6 Implement and manage all aspects of Waste Management Workplan for duration of work.
 - .7 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.
-
- 1.4 Waste Reduction
- .1 Develop waste reduction program.
 - .2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.
 - .3 Identify materials and equipment to be:
 - .1 Salvaged for resale by Contractor;
 - .2 Sent to recycling facility;
 - .3 Sent to waste processing/landfill site for their recycling effort;
 - .4 Disposed of in approved landfill site.
 - .4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
 - .1 Use of a central cutting area to allow for each
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- access to off-cuts;
- .2 Use of off-cuts for blocking and bridging elsewhere.
 - .3 Use of effective and strategically placed facilities on site for storage and staging of leftover or partially cut materials (such as plywood, dimension timber, etc.) to allow for easy incorporation into work whenever possible, avoiding unnecessary waste.
- .5 Develop other strategies and innovative procedures to reduce waste.
- 1.5 Material Source Separation Process
- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
 - .2 Provide on-site facilities to collect, handle and storage anticipated quantities of reusable, salvageable and recyclable materials.
 - .1 Use suitable containers for individual collection of items based on intended purpose.
 - .2 Locate to facilitate deposit but without hindering daily operations.
 - .3 Clearly mark containers and stockpiles as to purpose and use.
 - .3 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.
- 1.6 Worker Training and Supervision
- .1 Provide adequate training to workforce, through meetings and demonstrations, to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.
 - .2 Waste Management Coordinator: designate one full-time person on site, experience din waste management and having knowledge of the purpose and content of Waste Management Plan to:
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- .1 Oversee and supervise waste management during work.
 - .2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.
 - .3 Post a copy of Plan in a prominent location on site for review by workers.
- 1.7 Disposal Requirements
- .1 Burying or burning of rubbish and waste materials is prohibited.
 - .2 Disposal of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited.
 - .3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.
 - .4 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, construction waste materials have been banned from disposal in landfills. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
 - .5 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
 - .6 Sale of salvaged items by Contractor to other parties not permitted on site.
 - .7 Dispose or store creosote and asphalt materials in provincially approved manner.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 01 78 00 - Closeout Submittals.
- 1.2 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 interim 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 Project record as-built documents.
- .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.
- 1.3 Cleaning .1 In accordance with Section 01 74 11 - Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
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PART 2 - PRODUCTS

2.1 Not Used .1 Not Used.

PART 3 - EXECUTION

3.1 Not Used .1 Not Used.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 - Submittal Procedures
 - .2 Section 01 77 00 - Closeout Procedures
- 1.2 Project Record Drawings
- .1 Departmental Representative will provide 2 white print sets of contract drawings and 2 copies of specifications manual specifically for "as-built" purposes.
 - .2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.
 - .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative upon request.
 - .4 As-Built Drawings:
 - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).
 - .2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.
 - .3 Stamp all drawings with "As-Built Drawings." Label and place Contractor's signature and date.
 - .4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
 - .5 Record the following information:
 - .1 Depths of various elements, to include pile tip depths, in relation to survey datum;
 - .2 Horizontal and vertical location of various elements in relation to Geodetic Datum;
 - .3 Field changes of dimension and detail;
 - .4 Location of all capped or terminated services and utilities;
 - .5 All design elevations, sections and details dimensioned and marked up to consistently report finished installation conditions;
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- .6 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
 - .7 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
- .5 Maintain As-Built document current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 03 20 00 - Concrete Reinforcing.
 - .2 Section 03 30 00 - Cast-in-Place Concrete.
- 1.2 References
- .1 Canadian Standards Association (CSA International) (latest editions):
 - .1 CSA-A23.1-04/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86-14, Engineering Design in Wood.
 - .3 CSA O121-08(R2013), Douglas Fir Plywood.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CSA O153(R2013), Poplar Plywood.
 - .6 CAN/CSA-O325-16, Construction Sheathing.
 - .7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.
 - .8 CSA S269.1-16, Falsework and Formwork.
 - .9 CAN/CSA-S269.3-M92(R2013), Concrete Formwork, National Standard of Canada
- 1.3 Submittals
- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit shop drawings for formwork and falsework.
- 1.4 Waste Management and Disposal
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal and the Waste Reduction Workplan.
- 1.5 Measurement Procedures
- .1 This item will not be measured separately.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Formwork Materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.
 - .2 Form Ties:
 - .1 Use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
 - .3 Form release agent: non-toxic, biodegradable, low VOC.
 - .4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm² /s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
 - .5 Falsework materials: to CSA-S269.1.

PART 3 - EXECUTION

- 3.1 Fabrication and Erection
- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
 - .2 Fabricate and erect falsework in accordance with CSA S269.1.
 - .3 Do not place shores and mud sills on frozen ground.
 - .4 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
 - .5 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
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- .6 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
 - .7 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
 - .8 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
 - .9 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.
- 3.2 Removal and Reshoring
- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 Seven (7) days for all concrete or until concrete reaches 70% of its 28 day design strength.
 - .2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 03 10 00 - Concrete Forming and Accessories.
.2 Section 03 30 00 - Cast-in-Place Concrete.
- 1.2 Measurement Procedures .1 This item will not be measured separately.
- 1.3 References .1 Canadian Standards Association (CSA International)(latest editions):
.1 CSA-A23.1-04/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CSA-A23.3-14, Design of Concrete Structures.
.3 CAN/CSA-G30.18-09(R2014), Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.
.4 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.
.6 CSA W186-M1990(R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.
.2 Reinforcing Steel Institute of Canada (RSIC)
.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.
- 1.4 Submittals .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
.3 Submit shop drawings including placing of reinforcement and indicate:
.1 Bar bending details.

- .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
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- .4 Detail lap lengths and bar development lengths to CSA-A23.3, unless otherwise indicated.
 - .5 Quality Assurance: in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
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- 1.5 Delivery, Storage and Handling
 - .1 Waste Management and Disposal:
 - .1 Separate waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic in designated containers.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Substitute different size bars only if permitted in writing by Departmental Representative.
 - .2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
 - .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-G30.18.
 - .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
 - .5 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

- 2.2 Fabrication
- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
 - .2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
 - .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
- 2.3 Source Quality Control
- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

PART 3 – EXECUTION

- 3.1 Field Bending
- .1 Do not field bend/field weld reinforcement.
 - .2 Replace bars, which develop cracks or splits.
- 3.2 Placing Reinforcement
- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.
 - .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
 - .3 Ensure cover to reinforcement is maintained during concrete pour.

-- 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/ Submissions requirements.
- 1.2 Reference Standards
- .1 Do structural concrete work in accordance with CSA A23.1-14, Concrete Materials and Methods of Concrete Construction, except where more stringent standards specify otherwise.
 - .2 CSA A3000-13, Cementitious Materials Compendium.
 - .3 ASTM C494-15A, Chemical Admixtures for Concrete.
 - .4 ASTM C1116/C1116M – 10 (R2015) Standard Specification for Fiber-Reinforced Concrete.
- 1.3 Submissions
- .1 Shop Drawings:
 - .1 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 Province of Prince Edward Island.
 - .2 Submit placement drawings for reinforcing steel.
 - .3 Submit placement drawings for miscellaneous items.
 - .2 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.
 - .2 Submit concrete mix design.
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- .3 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.
 - .2 Provide certification that plant, equipment, and materials to be used in concrete work comply with requirements of CSA A23.1.
 - .3 Provide certification that mix proportions selected will produce concrete of specified quality, yield, and strength and will comply with CSA A23.1.
 - .4 Provide certification that concrete will not include alkali - reactivity aggregates.

 - .4 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 Concrete deck finishing operations.
 - .5 Supporting reinforcing steel.
 - .6 Protection and curing of concrete in cold and hot weather.

 - .5 Test Results:
 - .1 Provide design mix tests results.
 - .2 Provide mill test certificates for reinforcing steel.
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- 1.4 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.
- 1.5 Source Sampling
- .1 At least three (3) weeks prior to commencing work, inform Departmental Representative of proposed source of aggregates and provide access for sampling.
- 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 ticket.
 - .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.
- 1.7 Measurement for Payment
- .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.

PART 2 – PRODUCTS

- 2.1 Materials
- .1 Aggregates: to CSA A23.1, for Class "C-1" exposure.
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- .2 Portland Cement: to CSA A3000, normal Type GU.
 - .3 Water: to CSA A23.1.
 - .4 Admixtures:
 - .1 Air entraining admixtures: to CSA A3000.
 - .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, ID, or 2.
 - .7 Adhesive Anchors: high strength epoxy to ASTM C881, Type IV, Grade 3. Acceptable Products: AC 100 Chemical Anchors by Powers Fasteners, Set Epoxy by Simpson Strong Tie, Hilti HY-200.
- 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 For concrete in general wharf construction:
 - .1 Use concrete mix designed to produce air entrained concrete meeting the following requirements:
 - .2 Cement to be normal Portland cement, Type GU.
 - .3 Minimum compressive strength at 28 days: 35 MPa.
 - .4 Exposure: Class C-1.
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- .5 Maximum aggregate size to CSA A23.1 table 11, Group 1, 20 mm size.
 - .6 Minimum cement content 390 kg/m³.
 - .7 Air content: 6 to 8%.
 - .8 Maximum water/cement ratio to be 0.40.
 - .9 Slump at time and point of discharge 80 mm ± 20 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 For fiber reinforced concrete pile jackets:
- .1 Use concrete mix designed to produce air entrained concrete meeting the following requirements.
 - .1 Cement to be normal Portland Cement Type GU.
 - .2 Exposure Class: C-1.
 - .3 Compressive strength at 28 days: 35MPa.
 - .4 Maximum aggregate size to CSA A23.1, Table 11, Group I, 10mm size.
 - .5 Slump to be 190mm ± 40mm.
 - .6 Micro fibers to be fibrillated polypropylene that complies with ASTM C1116/C1116M, Section 4.1.3, Type III and Note 2. Acceptable Products: Master Fiber F100, ConLoc, Tuf-Strand SF by Euclid.
 - .1 Fiber Length: 38mm.
 - .2 Dosage: 2.0kg/m³.
 - .3 Modify concrete mix to the approval of the Departmental Representative to accommodate pumping.
 - .4 Admixtures to the approval of the Departmental Representative and the

- recommendation of the manufacturer. Admixtures must be dispersed separately into mixing water.
- .5 Do not use calcium chloride or compounds containing calcium chloride.
 - .6 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.
 - .7 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.
 - .8 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1.
 - .9 Provide certification from independent testing and inspection company that mix proportions selected will produce concrete of specified quality and can be effectively placed and finished for all work under this contract.
 - .10 Add micro fibers to concrete according to manufacturer's recommendations.
 - .11 Use plasticizer to increase slump and workability.
 - .12 Departmental Representative to review fiber mixing procedures and mix design.

PART 3 – EXECUTION

3.1 General

- .1 Obtain Departmental Representative's approval before placing concrete. Provide 24 hours notice of intended placement. Place concrete in dry form condition.
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- .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 Province of Nova Scotia.
 - .9 Comply with additional requirements of CSA A23.1, for concrete exposed to seawater environments during placement and curing.
 - .10 Clean pile surface with high pressure water jets, mechanical scrapers and other means prior to placement of concrete jackets.
 - .11 Location of construction joints and sequence of placing to be determined by professional engineer registered in the Province of Nova Scotia and
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submitted to Departmental Representative for review prior to commencing construction.

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 to 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 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.
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- .2 Place concrete in areas that are completely clean, free from water, ice, debris, and all unsuitable materials. Permit the Departmental Representative to review the prepared substrate prior to placement of concrete.
 - .3 Place all concrete within 1.5 hours of initial mixing. If 1.5 hours is insufficient, provide a set retarder sufficient in quantity to allow for proper placement.
 - .4 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 pipe line is to be used, void pipe line in a manner that prevents contamination of concrete or separation of ingredients.
 - .5 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.
 - .6 Vibrate and tamp each layer of concrete 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.
 - .7 Fiber reinforced concrete jackets to be placed in dry forms.
 - .8 Concrete with a temperature less than 10°C or greater than 30°C at the time of delivery or placement shall not be used.
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3.5 Inserts

- .1 Set galvanized sleeves and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100mm not indicated on the structural drawings must be approved by the 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 the Departmental Representative before placing of concrete.
- .3 Any galvanized items embedded in concrete shall 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 agreement, grout anchor bolts in pre-formed holes or holes drilled after concrete has set. Formed holes to be at least 100mm in diameter. Drilled and epoxied or grouted holes to be minimum 25mm larger in diameter than bolts used, unless indicated otherwise by manufacturer's recommendations.
 - .3 Protect anchor bolt holes from water accumulations.
 - .4 Set bolts and fill holes with non-shrink grout.

3.6 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.
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- .4 Provide coarse broom finish using steel wire or stiff, coarse, fibre broom. Use broom in a transverse ridges 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.
- 3.7 Protection and Curing
- .1 Provide protection and curing in accordance with CSA A23.1.
 - .2 Protect concrete with windproof shelter(s) to allow free circulation of inside air around fresh concrete. Do not let walls of shelter touch formwork. Provide sufficient space in shelters for removal of formwork.
 - .3 Keep concrete surfaces continuously moist during concrete curing and protection stage and allow concrete to dry gradually before removal of protection.
 - .4 Protect freshly deposited concrete from premature drying and excessively hot and cold temperatures and shall maintain concrete without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete. Freshly deposited concrete shall be protected from the harmful effects of sunshine, drying winds, cold and hot weather, running or surface water, mechanical shock, vandalism, etc.
 - .5 When the air temperature is at or below 10°C or when there is a probability of falling below 10°C within 24 hours of placing, as forecast by the nearest official meteorological office, all materials and equipment needed for adequate protection and curing during cold weather shall be on hand and ready for use before concrete placement is started. Extent of such preparation shall be in accordance
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with the requirements of CSA A23.1 and to the approval of the Departmental Representative.

- .6 When placing concrete during cold weather, adequate protection of concrete shall be provided for the duration of the curing and protection period as defined in CSA A23.1, clause 7.4.1. Protection shall be provided by means of heated enclosures, coverings, insulation, or a suitable combination of these methods.
 - .7 Enclosures:
 - .1 Construct to withstand wind and snow loads.
 - .2 Make reasonably air tight.
 - .3 Housing to provide sufficient space between the concrete and the enclosure to permit free circulation of warmed air.
 - .4 Supply heat to the enclosure by live steam, forced hot air, stationary heaters or other heaters of various types. Exhaust fumes shall be exhausted from enclosures and there shall be no build-up of exhaust fumes within heated enclosures.
 - .8 Take extreme care with curing methods during cold or hot weather concreting and shall supply approved equipment in order to maintain inside air within the following temperatures.
 - .1 For initial 3 consecutive days at not less than 10°C and not more than 25°C, at surfaces.
 - .2 Wet cure concrete for additional 4 consecutive days at not less than 10°C and not more than 35°C for the time necessary to attain 70% of the specified strength.
 - .3 Maintain temperature of concrete as close as possible to suggested minimum temperature of 10°C during the curing period.
 - .4 If using silica fume in concrete, additional curing procedures shall be used and cure time shall be extended, as necessary.
 - .5 Reduce temperature near end of curing period at rate not exceeding 20°C per day.
 - .6 No salt or other chemical shall be used to lower the freezing point of the concrete as a
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substitute for the specific curing and protection.

.7 Do not overheat concrete.

3.8 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.

.2 Departmental Representative will pay for Quality Control costs of tests as specified in Section 01 41 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. Additional testing required due to defective materials or failed test shall be at Contractor's cost.

.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.

3.9 Defective Work

.1 Concrete is defective when:

.1 It fails to meet any requirement of this specification.

.2 The concrete contains honeycombing or embedded debris.

.3 The 28-day strength in any area is less than 95% of specified minimum.

.4 Concrete test results fail any other aspect/test of CSA A23.1.

- .2 If concrete is found to not meet these specifications or code requirements, repair or remove and replace defective work as directed by Departmental Representative, at no additional cost to the Contract.
- .3 If necessary, take corrective measures as directed by the Departmental Representative to prevent the occurrence of further defective concrete.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Description .1 This section specifies requirements for the supply, fabrication, delivery and installation of ladders, mooring cleats, and other miscellaneous metals required to complete the work.
- 1.2 Related Sections .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
- .3 Section 03 30 00 - Cast-in-Place Concrete
- .4 Section 31 61 13 - Pile Foundations, General Requirements
- 1.3 References .1 American Society for Testing and Materials International (ASTM):
- .1 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian Standards Association (CSA International):
- .1 CAN/CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
- .2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16-14, Design of Steel Structures.
- .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in cooperation with the Canadian Welding Bureau).
- .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- 1.4 Measurement for Payment .1 Miscellaneous Steel: Miscellaneous steel will be measured for payment in kilograms (kg). Calculations will be based on the dimensions indicated on the drawings. This work shall include the fabrication, supply, galvanizing, delivery and installation of all steel angles and plates. All material waste, storage
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and handling requirements, and all coating touch ups will be considered incidental to this work.

2. Ladders: Ladders, including holdfasts, rungs and fastenings, will be measured for payment per each. Bolts, hardware, and galvanized finishes will not be measured, but considered incidental to the work. Timber fenders shall not be considered part of this work.

.3 Mooring Cleats: Mooring cleats will be measured for payment per each. Bolts, hardware and finishes will not be measured, but considered incidental to the work.

1.5 Submittals

.1 Shop Drawings:
.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details and accessories.
.3 Shop drawings containing any contractor designed connections or details shall bear the dated stamp and signature of a Professional Engineer licensed in the province of Prince Edward Island.

1.6 Quality Assurance

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

PART 2 - PRODUCTS

2.1 Materials

.1 Steel sections and Plates: to CAN/CSA-G40.20/G40.21, Grade 350W.

- .2 Welding Materials: to CSA W59.
- .3 Welding Electrodes: to CSA W48 Series.
- .4 Bolts and Anchor Bolts: to ASTM A307.
- .5 Ladder Rungs: to CSA C-40.21 round bars to size as indicated.
- .6 Mooring Cleats: cast iron to ASTM A48, Class 30, with approximate weight of 43kg(95lb) each with a safe working load of 75kN (8.5tons). Use approved high strength anchor bolts.

2.2 Fabrication

- .1 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .2 Machine bolts will have standard heads, nuts and, when in position, will be of sufficient length to permit a full nut and two washers. Treads shall be Coarse Thread Series as specified in latest ANS/B1-1 having a Class 2A tolerance.
- .3 Standard cast iron washers suitable for the size of the bolt specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces unless noted otherwise on the drawings. Ogee washers to Timber Design Manual issued by Laminated Timber Institute of Canada and to be cast iron, free from injurious defects or impurities. As an alternative to Ogee washers, standard galvanized plate washers can be used. The washer is to be three times the bolt diameter and a minimum thickness of 8mm. Square washers are not permitted.

2.3 Finishes

- .1 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m² to CAN/CSA-G164.
 - .2 Zinc Primer: zinc rich, ready mix to CAN/CGSB-1.181.
-

- 2.4 Mooring Cleats .1 Mooring cleats to be cast iron to ASTM A48, Class 30, with approximate weight of 43kg (95lb) each with a safe working load of 75 kN (8.5 tons). Use approved high strength anchor bolts.

PART 3 - EXECUTION

- 3.1 Erection
- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
 - .2 Touch up field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
 - .3 Take necessary care in the handling of all galvanized steel parts to prevent damage to the galvanized coating. Evidence of damage shall be cause for rejection. Damage may be touched up if approved by Departmental Representative.
 - .4 Touch up galvanized surfaces with zinc rich primer where burned by field welding.
- 3.2 Mooring Cleats
- .1 Secure cleats with 25mm diameter anchor bolts of length required and complete with associated nuts and washers.
 - .2 If required, grout under base of cleat using a non-shrink, non-metallic type of grout to obtain a smooth, level surface.
 - .3 After cleat installation is complete, bolt holes in cleats will be filled with approved waterproofing compound and painted.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 01 33 00 - Submittal Procedures
- 1.2 Reference Standards
- .1 ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
 - .2 CAN/CSA-080 Series 2008 (R2012), Wood Preservation (including CSA preliminary standard O80.31-M1989).
 - .3 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .4 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .5 Copper naphthenate containing 2% copper for Brush or Spray Treatment for Field Cuts.
 - .6 CSA 086-14, Engineering Design in Wood (Limit States Design).
 - .7 NLGA Standard grading rules for Canadian Lumber 1980 edition or most recent at time of tendering.
 - .8 ASTM D4637-15, EPDM Sheet used in Single-Ply Roof Membrane.
 - .9 ASTM B111-1974 (R2001) Wire Nails, Spikes and Staples.
 - .10 CAN/CSA-G164-M92 (or latest edition) – Hot Dip Galvanizing of Irregularly Shaped Articles.
- 1.3 Submittals
- .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 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.

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 Timber Treatment:

.1 Preservative treatment to CAN/CSA-080 Series-08 for Marine Construction Coastal Waters. Where assay retentions are not indicated, they are to be taken as 1.5 times the indicated gauge retention.

.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 and submitting a pre-printed form, agreed to by the Departmental Representative, containing the above information.

- .4 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 Spikes: to CSA B111.
 - .3 Hot dip galvanized hardware, bolts, nuts, washers and spikes to CSA G164, with minimum zinc coating of 600 g/m².
 - .4 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, off loading 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.
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- .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 properly and safely handle the treated materials and to apply field treatment, so as to prevent undue hazard to themselves, others, or to the environment.
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- .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.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Refer to other specification sections for related information.
 - .2 Refer to Section 01 33 00 for Shop Drawing/ Submission requirements.
- 1.2 Source Approval
- .1 Source of materials to be incorporated into work or stockpiled requires acceptance.
 - .2 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production.
 - .3 If, in the opinion of Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet specified requirements, procure an alternative source to demonstrate that materials from source in question can be processed to meet specified requirements.
 - .4 Should a change of material source be proposed during work, advise Departmental Representative 4 weeks in advance of proposed change to allow sampling and testing.
 - .5 Acceptance of material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory.
- 1.3 Production Sampling
- .1 Aggregate will be subject to continual sampling during production.
 - .2 Provide Departmental Representative with ready access to source and processed material for the purpose of sampling and testing.
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- 1.4 Measurement for Payment .1 This item will not be measured separately.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material or other deleterious substances.
 - .2 Flat and elongated particles are those whose greatest dimension exceeds four times their least dimension.
 - .3 Fine aggregates satisfying requirements of applicable section shall be one, or a blend of the following:
 - .1 Natural sand
 - .2 Manufactured sand
 - .3 Screening produced in crushing of quarried rock, boulders, gravel or slag
 - .4 Coarse aggregates satisfying requirements of applicable section shall be one of the following:
 - .1 Crushed rock or slag
 - .2 Gravel composed of naturally formed particles of stone.

PART 3 - EXECUTION

- 3.1 Development of Aggregate Source
- .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by the Departmental Representative.
 - .2 Clear, grub and strip an area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
 - .3 When operating in stratified deposits, use excavation equipment and methods that will produce a uniform, homogeneous aggregate.
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- .4 When excavation is completed, provide drains or ditches as required to prevent surface standing water.
 - .5 Trim off and dress slopes of waste material piles and leave site in a neat condition.
- 3.2 Processing
- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 Blend aggregate, if required, to obtain gradation requirements specified. Use approved methods and equipment.
 - .3 Blending to increase percentage of crushed particles or decrease percentage of flat and elongated particles is permitted.
 - .4 Wash aggregates, if required, to meet specifications. Use only equipment accepted by Departmental Representative.
- 3.3 Handling
- .1 Handle and transport aggregates to avoid segregation, contamination and degradation.
- 3.4 Stockpiling
- .1 Stockpiling aggregates on stabilized, clean and well drained surfaces.
 - .2 To ensure that no material other than stockpiled aggregate is used, do not incorporate bottom 250 mm of stockpile into work, if aggregates are stockpiled on ground.
 - .3 Stockpile far enough apart to prevent intermixing.
 - .4 Reject intermixed or contaminated materials. Remove and dispose of rejected materials as directed within 48 hours of rejection.
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- .5 Stockpile materials in uniform layers of thickness as follows:
 - .1 Max 1 m for coarse aggregate and base course materials.
 - .2 Max 2 m for fine aggregate and sub-base materials.
 - .3 Max 1.5 m for other materials.
- .6 Complete each layer over entire stockpile area before beginning next layer.
- .7 Uniformly spot dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .8 Coning of piles or spilling of material over edges of pile will not be permitted.
- .9 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Description of Work
- .1 This section includes, but is not limited to, the following:
- .1 Requirements for the demolition, removal or cutting associated with existing structural material, existing concrete curbs, copewall and slab, timber piles and fastening, and all excavation to permit construction and installation of the new wharf.
 - .2 Removal, salvage and reinstallation of existing electrical components and teck cable feeds.
 - .3 Requirements for temporary utilities as per Section 01 51 00.
 - .4 All normal removals as required to complete the work. All items to be verified by a site visit prior to submission of a tender.
- 1.2 Related Sections
- .1 Refer to other specification sections for related information.
- .2 Refer to Section 01 33 00 for Shop Drawing/ Submission requirements.
- 1.3 Submissions
- .1 Methodology:
- .1 When requested, provide methodology for carrying out the work.
 - .2 Provide submission in accordance with Section 01 33 00.
- 1.4 Protection
- .1 Prevent movement, settlement or damage of adjacent structures. Provide bracing and shoring as required. In the 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.

1.5 Measurement Procedures .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.

PART 2 – PRODUCTS

2.1 Not Applicable .1 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.

3.2 Demolition and Removals .1 Remove items indicated.

.2 Do not disturb adjacent structures designated to remain in place.

.3 Remove existing concrete, timber and hardware. Salvage rock materials for re-use on site. Excess ballast which cannot be utilized within the work or materials which do not meet the new work material and gradation requirements are to be removed from the site.

.4 The Contractor must ensure timbers are not permitted to go adrift during removal operations. Containment booms and regular cleaning of debris from the harbour

bottom must occur in conjunction with the removal operations.

- .5 The Contractor must exercise caution during excavation and removals adjacent to the existing wharf structures, wharf and complete excavation in such a manner as to protect the existing structure from undermining.
- .6 Sawcut existing concrete deck at pile cap at end limits of removals where indicated on the plan.
- .7 Existing concrete materials to be disposed of. Salvage existing electrical teck cable for future use.
- .8 Remove, salvage and reinstate existing electrical equipment and teck cables.

3.3 Disposal
of Materials

- .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 Proof in the form of receipt from an approved disposal facility will be required.

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 Related Sections
- .1 Section 01 33 00 - Submittal Procedures
 - .2 Section 01 45 00 - Quality Control
 - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
 - .4 Section 01 35 44 - Environmental Protection Procedures for Marine Work
 - .5 Section 31 05 17 – Aggregates - General
 - .6 Section 31 32 19.01 - Geotextiles
 - .7 Section 31 62 16.13 - Steel Sheet Piles
- 1.2 Measurement Procedures
- .1 New backfill will be measured in Tonnes compacted in place. Payment will include supply, handling, trucking, placing, compacting and all related work (Type 1 fill).
 - .2 Granular base material will be measured in the Tonnes compacted in place of material supplied and acceptably placed in the works to the lines and grades as shown on the drawings (Class A and Borrow).
 - .3 Excavation of all existing materials, including existing rip rap materials, will be measured in a cubic meter basis. Payment will include all excavating, transporting and disposal of all materials off site.
- 1.3 References
- .1 Canadian General Standards Board (CGSB):
 - .1 [CAN/CGSB-8.2-M88](#), Sieves, Testing, Woven Wire, Metric.
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- 1.5 Submittals .1 Samples:
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform Engineer at least 4 weeks prior to commencing work, of proposed source of fill materials and provide access for sampling.
- 1.6 Waste Management and Disposal .1 Separate and recycle waste materials in accordance with 01 74 21 - Construction / Demolition Waste Management and Disposal.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
 - .3 Place materials defined as hazardous or toxic in designated containers.
 - .4 Ensure emptied containers are sealed and stored safely.
- 1.7 Protection of Existing Features .1 Existing buried utilities and structures:
- .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .2 Confirm locations of buried utilities by careful test excavations.
 - .3 Maintain and protect from damage, water, sewer, electric, telephone and other utilities and structures encountered.
 - .4 Where utility lines or structures exist in area of excavation, obtain direction of the Departmental Representative before removing or re-routing. Costs for such work to be paid by the Departmental Representative.
 - .5 Record location of maintained, re-routed and abandoned underground lines.
 - .6 Confirm locations of recent excavations adjacent to area of excavation.
-

PART 2 - PRODUCTS

2.1 Materials

PART 3 - EXECUTION

3.1 Site Preparation

- .1 Remove obstructions, ice and snow from surfaces to be excavated within limits indicated.

3.2 Excavation

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Dispose of surplus and unsuitable excavated material off site.
- .5 Obtain Departmental Representative's approval of completed excavation.
- .6 Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

3.3 Backfilling

- .1 Do not proceed with backfilling operations until Engineer has inspected and approved installations.
 - .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
 - .3 Do not use backfill material which is frozen or contains ice, snow or debris.
 - .4 Backfill below LNT and up to 600 mm above LNT may be end dump.
 - .5 From 600 mm above LNT up to finish grade, place backfill material in uniform layers not exceeding 300
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mm compacted thickness. Compact each layer to 100% of Standard Proctor Dry Density before placing succeeding layer.

- .6 When using hand operated tamping devices, place backfill material in layers not exceeding 100 mm in thickness.
- .7 Place backfill material in uniform layers simultaneously on both sides of the tie rods anchor blocks so that loading is equivalent.
- .8 In compacting backfill, do not bend or damage tie rods in any way.
- .9 Backfilling around installations.
 - .1 Do not backfill around or over cast-in- place concrete within 24 hours after placing of concrete.
- .10 If any backfill material is placed before the wharf structure is in place, ensure that none of the backfill material is washed outside the area to be filled.

3.4 Granular Base

- .1 Do not place granular base until sub-base surface is inspected and approved.
- .2 Place materials to the lines, grades and dimensions indicated or as directed. Place only on a properly shaped and compacted surface.
- .3 Compact granular base to 100% of Standard Proctor Dry Density.

3.5 Restoration

- .1 Upon completion of work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes and correct defects as directed by the Departmental Representative.
- .2 Replace topsoil as indicated and as directed by the Departmental Representative.

- .3 Reinststate lawns to elevation which existed before start of project.
- .4 Reinststate pavements disturbed by project work to thickness, structure and elevation which existing before excavation unless otherwise noted on the drawings.
- .5 Clean and reinststate areas affected by work as directed by the Departmental Representative.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 - Submittal Procedures
 - .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
 - .3 Section 31 11 00 – Sitework Demolition and Removal
- 1.2 Measurement Procedures
- .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement
- 1.3 References
- .1 American Society for Testing and Materials International, (ASTM):
 - .1 ASTM D4491-99a (latest edition), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .2 ASTM D4595-86(2001)(latest edition), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .3 ASTM D4716-01 (latest edition), Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - .4 ASTM D4751-99a (latest edition), Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - .2 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-4.2 No. 11.2-M89(April 1997) (latest edition), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1 (latest edition), Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-M85, Methods of Testing
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Geosynthetics - Thickness of Geotextiles.

.3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.

.4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

.5 No.10-95, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

- 1.4 Submittals
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit to Departmental Representative the following samples at least 4 weeks prior to beginning work:
 - .1 Minimum length of 2 m of roll width of geotextile.
 - .3 Submit to Departmental Representative copies of mill test data and certificate at least 4 weeks prior to start of work, and in accordance with Section 01 33 00 - Submittal Procedures.
- 1.5 Delivery, Storage and Handling
- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.
- 1.6 Waste Management and Disposal
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging
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material for recycling in accordance with Waste Management Plan.

- .4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 Materials

- .1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
 - .1 Width: 3.5 m minimum.
 - .2 Length: 4.0 m minimum.
 - .3 Composed of: minimum 85% by mass of polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days.
 - .2 Physical Properties:
 - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 400 g/m².
 - .2 Grab tensile strength and elongation: to CAN/CGSB-148.1.
 - .1 Breaking force: minimum 800 N, wet condition.
 - .2 Elongation at future: minimum to maximum 70-100%.
 - .3 Hydraulic Properties:
 - .1 Apparent opening size (AOS): 50 to 150 micrometres.
 - .4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.
 - .5 Factory seams: sewn in accordance with manufacturer's recommendations.
 - .6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.
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PART 3 - EXECUTION

3.1 Installation

- .1 Place geotextile material by unrolling onto surface in orientation, manner and locations indicated and retain in position with securing pins and washers or weights.
 - .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
 - .3 Place geotextile material on vertical and sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
 - .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
 - .5 Pin successive strips of geotextile with securing pins at intervals recommended by manufacturer.
 - .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
 - .7 After installation, cover with overlying layer within 4 hours of placement.
 - .8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
 - .9 Place neatly around wales and tie rods, ensure full coverage of entire area.
 - .10 Place and compact soil layers in accordance with Section 31 10 00 – Concrete Forming and Accessories.
 - .11 Place geotextile full length and width of inside steel sheet piling wall.
-

- 3.2 Cleaning .1 Remove construction debris from project site and dispose of debris in an environmentally responsible and legal manner.
- 3.3 Protection .1 Vehicular traffic not permitted directly on geotextile.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Refer to other specification sections for related information.
 - .2 Refer to Section 01 33 00 for Shop Drawing/ Submission requirements.
- 1.2 Reference Standards
- .1 ASTM C127-88(1993)e1 (or latest edition) Specific Gravity and Absorption of Coarse Aggregate.
 - .2 AASHTO T85-88 (or latest edition) Specific Gravity and Absorption of Coarse Aggregate.
- 1.3 Submissions
- .1 Product Data/Samples:
 - .1 Provide samples of materials proposed for work.
 - .2 Methodology:
 - .1 Provide methodology for carrying out the work.
 - .3 Provide submissions in accordance with Section 01 33 00.
- 1.4 Measurement for Payment
- .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.

PART 2 - PRODUCTS

- 2.1 Rip Rap
- .1 Hard durable crushed quarried rock, free from silt, clay, organic matter and other foreign substances and free from splits, seams or defects likely to impair its soundness during handling or under action of water.
 - .2 Specific gravity of not less than 2.65 when tested to ASTM C127 or AASHTO T85.
 - .3 Rip rap will be sized as shown on drawings and will be free of seams that would affect its durability.
-

- .4 Greatest dimension of each stone not to exceed two times least dimension.
- .5 Rip rap shall be quarried or field stone, rough and angular in shape.
- .6 Rip rap shall vary in size where shown on the drawings, subject to the follow gradation:
 - .1 100% shall be finer than (or equal) to 300kg
 - .2 70% -90% shall be finer than 200 kg
 - .3 0% shall be finer than 50 kg

PART 3 - EXECUTION

- 3.1 Preparation
 - .1 Sound area and record elevation of material on which rip rap will be placed before placing any stones.
 - 3.2 Placement
 - .1 Do not place rip rap material until bottom area has been accepted by Departmental Representative.
 - .2 Replace all existing material to its original position to the satisfaction of the Departmental Representative, prior to laying any new stone.
 - .3 Place rip rap material to avoid segregation of material sizes. Do not drop material through water.
 - 3.3 Tolerances
 - .1 Surface of bearing layer to be within 50 mm of elevation indicated and variation in elevation over whole area of bearing layer not to exceed 75 mm.
 - .2 Other layers to be within 100mm of lines shown.
 - 3.4 Protection
 - .1 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
-

- .2 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
- .3 The Contractor should note that the work site is subject to water level variations due to tidal action.
- .4 The Contractor will be responsible to replace any mattress lost due to storms, tidal erosion or by his own activities.

-- END OF SECTION --

PART 1 - GENERAL

- | | | | |
|-----|---------------------------------------|----|---|
| 1.1 | <u>Related Sections</u> | .1 | Section 01 74 21 - Construction/Demolition Waste Management and Disposal |
| | | .2 | Section 05 50 00 - Metal Fabrications |
| | | .3 | Section 31 62 18 – Steel H-Piles |
| | | | |
| 1.2 | <u>Delivery, Storage and Handling</u> | .1 | Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling. |
| | | .2 | Replace damaged piles as directed by Departmental Representative. |
| | | | |
| 1.3 | <u>Waste Management and Disposal</u> | .1 | Separate waste materials for in accordance with Section 01 74 21 - Construction/ Demolition Waste Management and Disposal. |
| | | | |
| 1.4 | <u>Existing Conditions</u> | .1 | Notify Departmental Representative in writing if subsurface conditions at site differ from those indicated and await further instructions from Departmental Representative. |
| | | | |
| 1.5 | <u>Scheduling</u> | .1 | Submit schedule of planned sequence of installing piles to Departmental Representative for review, not less than two weeks prior to commencement of pile installation. |
| | | | |
| 1.6 | <u>Submissions</u> | .1 | Methodology:
.1 Provide submissions in accordance with Section 01 33 00 – Submittal Procedures. |
| | | .2 | Product Data: submit manufacturer's printed product literature, specifications and datasheet. |
| | | .3 | Submit schedule of planned sequence of driving to Departmental Representative for review as specified. |
-

- .4 Equipment:
 - .1 Submit prior to pile installation for review by Departmental representative, list and details of equipment for use in installation of piles.
 - .2 Impact Hammers: submit manufacturer's written data as specified.
 - .3 Non-impact methods: submit characteristics to evaluate performance.
 - .5 Quality Assurance Submittals:
 - .1 Test Reports: submit three (3) copies of certified test reports for piles from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- 1.7 Measurement Procedures .1 See Section 01 29 00 – Payment Procedures.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Supply full length steel piles in as indicated in accordance with Section 31 62 18 – Steel Piles.
 - .2 Provide equipment of sufficient capacity to handle full length piles without cutting and splicing.
 - .4 Do not splice piles without written permission of Departmental Representative. When permitted, provide details for Departmental Representative's review. Design details of splice to bear dated signature stamp of professional engineer registered or licensed in the Province of Prince Edward Island.
 - .5 Welding materials to CSA W48.1.

PART 3 - EXECUTION

- 3.1 Equipment .1 Prior to pile installation, submit to Departmental Representative for review, details of equipment for installation of piles.
-

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- .1 Impact hammers: provide manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.
 - .2 Non-impact methods of installation such as augering, jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.
- .2 Hammer:
 - .1 When required criteria cannot be achieved with the proposed hammer, use larger hammer and take other measures as required.
 - .3 Leads:
 - .1 Construct pile driver leads to provide free movement of hammer. Hold leads in position at top and bottom with guys, stiff braces, or other means to ensure support to pile while being drive.
 - .2 Length: except for piles driven through water, provide sufficient length of leads to ensure that use of follower is unnecessary.
 - .3 Swing Leads: Obtain approval from Departmental Representative prior to using swing leads. Firmly guy top and bottom to hold pile in position during driving operation.
- 3.2 Preparation
- .1 Ensure that ground conditions at pile locations are adequate to support pile installing operation. Make provision for access and support of piling equipment during performance of work.
- 3.3 Field Measurement
- .1 Maintain accurate records of driving for each pile, including:
 - .1 Type and make of hammer, stroke or related energy.
 - .2 Other driving equipment, including water jet, driving cap, cushion.
 - .3 Pile size and length, location of pile in pile group, location or designation of pile group.
 - .4 Sequence of driving piles in group.
-

- .5 Number of blows per meter for entire length of pile and number of blows per 25 mm for last 1,000 mm.
 - .6 Final tip and cut-off elevations.
 - .7 Other pertinent information such as interruption of continuous driving, pile damage.
 - .8 Record elevation taken on adjacent piles before and after driving of each pile.
-
- .2 Provide Departmental Representative with three (3) copies of records.
-
- 3.4 Driving
- .1 Use driving caps and cushions to protect piles. Reinforce pile heads as required by Departmental Representative. Piles with damaged heads as determined by Departmental Representative will be rejected.
 - .2 Use steel drive shoes to protect pile toes during driving.
 - .3 Hold piles securely and accurately in position while driving.
 - .4 Deliver hammer blows along axis of pile.
 - .5 Reinforce pile heads if necessary.
 - .6 Re-strike already driven piles lifted during driving of adjacent piles to assure set.
 - .7 Cut off piles neatly and squarely at elevations as indicated.
 - .8 Remove cut off lengths from site on completion of work.
 - .9 Contractor shall install temporary lateral bracing during construction to maintain position of piles until casting of deck.
-
- 3.5 Design Load Capacity
- .1 Drive each pile to practical refusal in bedrock and to elevation indicated on the project drawings.
-

- .1 Do no overdrive to cause damage to piles in bedrock.
 - .2 Refusals defined as 4 blows for the last 25mm with a hammer delivering an energy of 750 J/cm of pile tip.
 - .2 Installation of each pile will be subject to approval of Departmental Representative.
 - .1 Departmental Representative will be sole judge of acceptability of each pile with respect to final driving resistance, depth of penetration or other criteria used to determine load capacity.
 - .2 Install each pile to pile tip elevation as indicated.
- 3.6 Obstructions
 - .1 Where obstruction is encountered that causes sudden unexpected change in penetration resistance or deviation from specified tolerances, proceed as directed by Departmental Representative.
- 3.7 Driving Tolerances
 - .1 Pile heads to be within 38mm of locations indicated.
 - .2 Piles not to be more than 0.25% of length out of alignment.
- 3.8 Repair/Restoration
 - .1 Pull out rejected piles and replace with new piles.
 - .2 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.
- 3.9 Protection
 - .1 Arrange pile installation operations and methods to avoid damages to adjacent existing structures. When damages occur, remedy damaged items to restore to original or better condition at own expense.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 – Submittal Procedures
 - .2 Section 01 45 00 – Quality Control
 - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
 - .4 Section 05 12 33 – Structural Steel
 - .5 Section 31 23 33.01 – Excavating, Trenching and Backfilling
- 1.2 Measurement Procedures
- .1 Measure supply of steel sheet piling in square metres of piling authorized by Departmental Representative and delivered to site.
 - .1 Calculate area by multiplying lengths of piles by widths.
 - .2 Width of steel sheet pile section is defined as centre to centre distance between pile interlocks measured along a plane parallel to finished wall.
 - .2 Measure supply and installation of sheet piling in square metres of piling remaining in place after cut-off.
 - .1 Piling will be measured in plane of bulkhead, calculated by multiplying straight horizontal centre line length of bulkhead measured at top of piles by average vertical length of piles installed and left in work.
- 1.3 References
- .1 Canadian Standards Association (CSA International).
 - .1 [CAN/CSA G40.20/G40.21-98\(June 2000\)](#) (latest edition), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 [CSA W47.1-92\(R2001\)\(latest edition\)](#), Certification of Companies for Fusion Welding of Steel Structures.
-

- .3 **CSA W47.1S1-M1989(R1998)(latest edition)**, Supplement No.1-1989 to W47.1-1983, Certification of Companies for Fusion Welding of Steel Structures.
- .4 [CSA W59-M1989\(R2001\)\(latest edition\)](#), Welded Steel Construction (Metal Arc Welding) (Metric Version).
- .5 [CSA W59S1-M1989\(R1998\)\(latest edition\)](#), Supplement No.1-M1989, Steel Fixed Offshore Structures, to W59-M1989, Welded Steel Construction (Metal Arc Welding).

1.4 Submittals

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 At least 2 weeks prior to fabrication, submit to Departmental Representative, two copies of steel producer certificates in accordance with [ASTM A 1011/A 1011M](#) , and mill test reports in accordance with [CAN/CSA-G40.20/G40.21](#).
- .3 Provide Departmental Representative with copy of certification for fusion welding in accordance with [CSA W47.1](#) and **CSA W47.1S1**.
- .4 Minimum 2 weeks prior to installation, submit to Departmental Representative the supplier's name and address, the selected steel sheet pile profile, and associated pile specifications.

1.5 Quality Assurance

- .1 Inspection and testing of steel sheet piling material will be carried out by testing laboratory designated by Departmental Representative at any time during course of Work.
 - .2 Materials inspected or tested by Departmental Representative which fail to meet contract requirements will be rejected.
-

- .3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, Contractor to pay costs for additional tests or inspections. Departmental Representative to approve corrected work.
- 1.6 Delivery, Storage and Handling
- .1 Use slings for lifting piling so that mass is evenly distributed and piling is not subjected to excessive bending stresses.
- .2 Store sheet piling on level ground or provide supports so that sheet piling is level when stored.
- .1 Provide blocking at spacing not exceeding 3 m so that there is no excessive sagging in piling.
- .2 Overhang at ends not to exceed 0.5 m.
- .3 Block between lifts directly above blocking in lower lift.
- .3 If material is stock-piled on structure, ensure that structure is not overloaded.
- 1.7 Waste Management and Disposal
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility for disposal approved by Departmental Representative.
- .5 Fold up metal banding, flatten and place in designated area for recycling.
-

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Steel sheet piles to be hot rolled to **CAN/CSA G40-23**.
 - .2 Steel sheet piles: to [CAN/CSA-G40.21](#), Grade 350W.
 - .3 Continuous interlocking Z trough section: having a minimum section modulus of 2600 cm³/m and a minimum thickness of 12.2 mm.
 - .4 Structural steel for wales, bearing plates, wales splices, capping channels, support angles and miscellaneous steel: to [CAN/CSA-G40.21](#), Grade 350W.
 - .5 Nuts and bolts: hexagon nuts, bolts, and washers: to [ASTM A 307](#).
 - .6 Backfill material: to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

PART 3 - EXECUTION

- 3.1 Installation
- .1 Do welding in accordance with [CSA W59](#) and [CSA W59S1](#), except where specified otherwise.
 - .2 Do not begin pile installation until required quality control tests have been completed and test results approved by Departmental Representative.
 - .3 Do pile installation Work in accordance with Section 31 61 13 - Pile Foundations, General Requirements except where otherwise specified.
 - .4 Submit full details of method and sequence of installation of piling to Departmental Representative for approval prior to start of pile installation work. Details must include templates, bracing, setting and driving sequence and number of piles in panels for driving.
 - .5 When installing sheet piles in bulkhead wall, use following procedure:
 - .1 Provide temporary templates or bracing to hold piles in alignment during setting and driving.
-

- .2 Drive piles two at a time. Drive first double pile to full depth, then place panel of five to eight double sheet piles in templates and secure last (end) double pile in location to prevent spreading of piles in panel. Sheet piles shall be driven to refusal in bedrock.
 - .3 Drive end double pile in panel sufficiently deep into ground to ensure that it will remain plumb, then, drive remaining double piles in panel to full depth beginning with double pile next to end double pile and finishing with double pile next to double pile first driven.
 - .4 After one panel has been driven, place and drive succeeding panels in similar manner. Complete the driving of end double pile of first panel after double piles of second panel have been driven.
 - .6 When installation is complete, face of wall at top of sheet piles to be within 75 mm of location as indicated and deviation from vertical not to exceed 1 in 100.
- 3.2 Obstructions
- .1 If obstruction encountered during driving, leave obstructed pile and proceed to drive remaining piles. Return and attempt to complete driving of obstructed pile later.
 - .2 Advise Departmental Representative immediately if impossible to drive pile to full penetration, and obtain direction from Departmental Representative on further steps required to complete Work.
- 3.3 Holes
- .1 Patch holes in sheet pile wall, except where permanent holes are indicated.
 - .1 Use 10 mm thick plate of material equal to that of piling to patch holes and overlap not less than hole diameter.
 - .2 Weld to develop full strength of plate.
 - .2 Drill any required holes in piling. Do not use flame cutting without permission of Departmental Representative.
-

3.4 Backfilling

- .1 Backfill in accordance with Section 31 23 33.01 -
Excavating, Trenching and Backfilling and as
indicated.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 – Submittal Procedures
 - .2 Section 01 45 00 – Quality Control
 - .3 Section 31 61 13 – Pile Foundations, General Requirements
- 1.2 Reference Standards
- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-1.171M-98, Inorganic Zinc Coating.
 - .2 Canadian Standards Association (CSA International):
 - .1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.
 - .2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.
 - .3 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
 - .4 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
 - .5 CAN/CSA S6-14, Canadian Highway Bridge Design Code (CHBDC).
 - .6 CAN/CSA S16-14, Design of Steel Structures.
 - .7 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- 1.3 Shop Drawings
- .1 Provide submissions in accordance with Section 01 33 00.
-

- 1.4 Waste Management and Disposal
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
 - .2 Divert unused metal materials from landfill to metal recycling factory as approved by Engineer.
- 1.5 Delivery, Storage, and Handling
- .1 Deliver, store and handle to prevent damage to products.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Deliver new, undamaged materials to site, accompanied by certified test reports, with manufacturer's logo and mill identification mark provided on H-piling.
 - .4 Storage and Protection:
 - .1 Store and handle H-piling in accordance with manufacturer's written instructions to prevent permanent deflection, distortion or damage to piles.
 - .2 Support H-piling on level blocks or racks spaced not more than 3 meters apart and not more than 0.60 meter from ends.
 - .3 Store H-piling to facilitate required inspection activities and prevent corrosion prior to installation.
- 1.6 Measurement for Payment
- .1 Measure supply and installation of steel piles in lineal metres of piling remaining in place after cut-off.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Welding Materials: to CSA W48.
 - .2 Steel Plates: to CSA G40.20/G40.21, Type and Grade 350.
-

- .3 Pile Driving Shoes: to CSA G40.20/G40.21, Grade 300.
- .4 Welding Electrodes: to CSA W48.
- .5 Welding and Weld Testing: to CSA W59.

PART 3 - EXECUTION

3.1 Fabrication

- .1 Fabricate full length piles to eliminate splicing during installation wherever possible.
- .2 Pile splicing will not be accepted with written permission from the Departmental Representative.
 - .1 Use complete joint penetration groove welds. Test weld soundness to W59 Section 11, Statically Loaded Structures.
- .3 Submit details of planned use of pile material stock to Departmental Representative for approval prior to start of fabrication. Re-use cut-off lengths as directed by Departmental Representative.
- .4 Allowable tolerance on axial alignment to be 0.25% as measured by 3 meter straight edge.
- .5 Allowable deviation from straight line over total length of fabricated pile to be 50mm.
- .6 Install pile cap reinforcement, splices and driving shoes as indicated.
- .7 Repair defective welds as directed by Departmental Representative.
 - .1 Repairs: to CSA W59.
 - .2 Unauthorized weld repairs may be rejected.

3.2 Installation

- .1 Install piling in accordance with Section 31 61 13 – Pile Foundations, General Requirements.
 - .2 Install driving shoes on each H-pile.
-

- .3 Hold piles securely and accurately in position while driving.
 - .4 Deliver hammer blows in direct axis of pile.
 - .5 The steel H-piles are to be driven vertically or by pre-drilling into the sandstone bedrock if the pile tip elevation cannot be achieved by impact hammer.
 - .6 Prior to commencement of pile installation, submit to Engineer for approval details of equipment and method to be used for the installation of the piles.
 - .7 Cut off piles squarely at required elevation.
 - .8 Touch-up scratches on uncoated surfaces with two applications of coal tar epoxy before after driving.
- 3.3 Pile Driving Criteria
- .1 Piles shall be driven using a hammer with a rated energy of at least 450 joules/cm² of steel cross-sectional area of steel piles to be driven. The contractor is responsible to provide proof of delivered energy of hammer, if proof is not acceptable the delivered energy will be considered as 25% of rated energy.
- 3.4 Tolerances
- .1 H-piles are to be installed to the elevation shown on the plan and specified herein.
 - .2 Deviations from the vertical in any direction shall not exceed 1 in 50.
 - .3 Twisted piles must be pulled and re-driven in such a manner so the face of the H-pile is square with the face of the wall. Maximum rotation tolerance about the axis of the pile layout to be +/- 1 degree.
 - .4 At the mud line, the piles are to be +/- 30mm of the location indicated on the drawings for the direction parallel to the wharf, with no two adjacent piles having a centerline spacing less than 3070mm. Tolerance at the top of the wharf will be +/- 15mm.
-

- 3.5 Welding
- .1 Weld to CSA W59 and CSA W59-S1.
 - .2 Welding certification of companies: to CSA W47.1 and CSA W47.1S1.
- 3.5 Acceptance Criteria
- .1 Installation of each pile will be subject to approval of Engineer. Engineer will be the sole judge of acceptability of each pile with respect to final depth of penetration or other criteria used to determine bearing capacity or pile stability. Engineer to approve final driving of each pile prior to removal of pile driving equipment.
 - .2 Any pile which becomes displaced as the result of the setting of adjacent piles shall be reset as per pile setting criteria.
 - .3 Piles shall be re-set after 24 hours of the end of installation of that pile until it can be demonstrated that the permanent pile capacity meets the specified capacity criteria.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Refer to other specification sections for related information.
 - .2 Refer to Section 01 33 00 for Shop Drawings/ Submission Requirements.
- 1.2 Submissions
- .1 Product Data/Samples:
 - .1 Provide samples of materials proposed for the work.
 - .2 Methodology:
 - .1 Provide methodology for carrying out the work.
- 1.3 Measurement for Payment
- .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Granular Base: Material to Section 31 05 17 and the following requirements:
 - .1 Crushed stone or gravel consisting of hard, durable, angular particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
 - .2 Class A granular fill gradation will be within the limits prescribed in PEI TIE General Provisions and Contract Specifications for Highway Construction Table 401-1.

PART 3 - EXECUTION

- 3.1 Placement
- .1 Do not place clear stone material until rock fill area has been accepted by Departmental Representative.
-

- .2 Place clear stone material to avoid segregation of material sizes.
 - .3 Level top surface to specified grade.
 - .4 Grade, lines, dimensions, and quantity of rock fill material to be reviewed and approved by the Departmental Representative before proceeding with pouring the concrete deck.
- 3.2 Tolerances
- .1 Surfaces of bearing layer to be within 25mm of elevation indicated and variation in elevation over whole area of bearing layer not to exceed 50mm. Variation shall be acceptable if the top surface is below the design grade only.
- 3.3 Protection
- .1 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
 - .2 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
 - .3 The Contractor should note that the work site is subject to water level variations due to tidal action.
 - .4 The Contractor will be responsible to replace any material lost due to storms, tidal erosion or by his own activities.

-- END OF SECTION --

PART 1 - GENERAL

- 1.1 Related Sections .1 Section 01 29 00 – Project Particulars & Measurement
- .2 Section 01 35 43 – Environmental Procedures
- .3 Section 31 05 17 – Aggregates - General
- .4 Section 31 23 33.01 – Excavation, Trenching and Backfilling
- 1.2 Measurement Procedures .1 Measurement for payment will be in accordance with Section 01 29 00 – Project Particulars and Measurement.
- 1.3 References .1 ASTM D2419-09, Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- .2 ASTM D3203-11, Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
- .3 ASTM D1159-07 (R2012), Test Method for Resistance to Plastic Flow of Bituminous Mixtures using Marshall Apparatus.
- .4 Prince Edward Island Department of Transportation, Infrastructure and Energy General Provisions and Contract Specifications for Highway Construction.
- 1.4 Supply of Materials .1 Notify Departmental Representative of proposed date for use of materials. Order and schedule shipments to coincide with construction schedule.
- 1.5 Source Sampling .1 At least 4 weeks prior to commencing work, inform Departmental Representative of proposed source of aggregates and provide access for sampling.
- .1 A copy of the location letter shall be forwarded to the Departmental Representative.
-

-
- .2 At least 4 weeks prior to commencing work, submit samples of the following materials proposed for use:
- .1 One 5 L container of asphalt cement.
- 1.6 Material Certification
- .1 At least 4 weeks prior to commencing work, submit viscosity-temperature chart for asphalt cement to be supplied showing Kinematic Viscosity in centistokes, temperature range 105-175°C.
- .2 Submit manufacturer's test data and certification that asphalt cement meets requirements of this section.
- 1.7 Submission of Mix Design
- .1 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for review at least 4 weeks prior to commencing work.
- 1/8 Delivery and Storage
- .1 Deliver and stockpile aggregates in accordance with Section 31 05 17 – Aggregates – General. Stockpile minimum 50% of total amount of aggregate required before commencing asphalt mixing operation.
- .2 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .3 Stockpile fine aggregate separately from coarse aggregate.
- .4 Provide approved storage, heating tanks and pumping facilities for asphalt cement.
- .5 Furnish copies of freight and weigh bills for asphalt cement as shipments are received. Departmental Representative reserves the right to check weights as material is received.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Shall conform to Type B Asphalt as specified in Section 603.03 of PEITIE General Provisions and Contract Specifications for Highway Construction.
-

PART 3 - EXECUTION

- 3.1 Plant and Remixing Requirements .1 Batch and continuous mixing plants:
- .1 To ASTM D995.
 - .2 Heat asphalt cement and aggregate to mixing temperature directed by Departmental Representative. Do not heat asphalt cement above 160°C.
 - .3 Before mixing, dry aggregates to a moisture content not greater than 0.5% by mass or to a lesser moisture content if required to meet mix design requirements.
 - .4 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, Departmental Representative will direct temperature of completed mix at plant and at paver after considering hauling and placing conditions.
 - .5 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.
 - .6 Feed cold aggregates to plant in proportions that will ensure continuous operations.
 - .7 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
 - .8 Store hot screened aggregates in a manner to minimize segregation and temperature loss.
 - .9 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.
 - .10 Maintain temperature of materials within plus or minus 5°C of specified mix temperature during mixing.
 - .11 Mixing time:
 - .1 In batch plants, both dry and wet mixing times as directed by Departmental Representative. Continue wet mixing as long as necessary to obtain a thoroughly blended mix but not less than 30s or more than 75s.
 - .2 In continuous mixing plants, mixing time as directed by Departmental Representative, but not less than 45s.
 - .3 Do not alter mixing time unless directed
-

by Departmental Representative.

- .2 Dryer drum mixing plant:
 - .1 Feed aggregates to burner end of dryer drum by means of a multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.
 - .2 Meter total flow of aggregate by an electronic weigh belt system with an indicator that can be monitored by plant operator and which is interlocked with asphalt pump so that proportions of aggregate and asphalt entering mixer remain constant.
 - .3 Provide for easy calibration of weighing systems for aggregates without having material enter mixer.
 - .4 Calibrate individual feed bin conveyors to ensure mix proportions are achieved.
 - .5 Make provision for conveniently sampling the full flow of materials from the cold feed.
 - .6 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.
 - .7 Provide a system interlock which will stop all feed components if either asphalt or aggregate from any bin stops flowing.
 - .8 Accomplish heating and mixing of asphalt mix in an approved parallel flow dryer-mixer in which aggregate and asphalt enter drum at burner end and travel parallel to flame and exhaust gas stream. Control heating to prevent fracture of aggregate or excessive oxidation of asphalt. Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with a printing recorder that can be monitored by plant operator. Submit printed record of mix temperatures at end of each day.
 - .9 Mixing period and temperature to produce a uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer to be less than 1%.
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- .3 Temporary storage of hot mix:
 - .1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.
 - .2 Do not store asphalt mix in storage bins in excess of 3 hours.

 - .4 While producing asphalt mix for this project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.

 - .5 Mixing Tolerances:
 - .1 Permissible variation in aggregate gradation from job mix (percent of total mass):

4.75 mm sieve	and larger	5.0
2.00 mm sieve		4.0
0.425 mm sieve		2.5
0.075 mm sieve		1.0
 - .2 Permissible variation of asphalt cement from job mix, 0.30%.
 - .3 Permissible variation of mix temperatures at discharge from plant, 10°C.
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- 3.2 Equipment
- .1 Pavers: mechanical (grade controlled) self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

 - .2 Rollers, general: sufficient number of rollers of type and weight to obtain specified density of compacted mix.

 - .3 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms.
 - .2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
 - .3 In cool weather or for long hauls, insulate entire content area of each truck box.
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- .4 Trucks which cannot be weighed in a single operation on scales supplied will not be accepted.
 - .4 Hand Tools:
 - .1 Lutes or rakes with covered teeth for spreading operations.
 - .2 Provide tamping irons having mass not less than 12 kg and a bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departmental Representative, may be used instead of tamping irons.
 - .3 Straight edges, 4.5 m in length, to test finished surface.
 - 3.3 Preparation
 - .1 Reshape granular roadbed to Departmental Representative's approval.
 - .2 Prior to laying mix, clean surfaces of loose and foreign material.
 - .3 Sawcut adjacent asphalt prior to placing new asphaltic pavement.
 - .4 Tack coat existing asphalt edges prior to placing new asphalt mix.
 - 3.4 Transportation of Mix
 - .1 Transport mix to job site in vehicles cleaned of foreign material in good mechanical working order, tight gates and with tarps.
 - .2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product at least once a day or as required. Elevate truck bed and thoroughly drain. No excess solution will be permitted.
 - .3 Schedule delivery of material for placing in daylight, unless Departmental Representative approves artificial light.
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- .4 Deposit mix from surge or storage silo into trucks in multiple drops and use methods necessary to prevent segregation.
- .5 Deliver material to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at a temperature within range directed, but not less than 130°C.

3.5 Placing

- .1 Obtain Departmental Representative's approval of base prior to placing asphalt.
 - .2 Place asphalt concrete to thicknesses, grades and lines indicated or directed by Departmental Representative.
 - .3 Placing Conditions:
 - .1 Place asphalt mixture only when air temperature is above 5°C.
 - .2 When temperature of surface on which material is to be placed falls below 10oC, provide extra rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place hot mix asphalt when pools of standing water exist on surface to be paved, during rain or when surface is damp.
 - .4 A material transfer device shall be used for the placement of all asphalt mix on the project. Prior to use, the material transfer device shall be approved by the Departmental Representative.
 - .4 Place asphalt concrete in compacted lifts of thickness as noted on the plans.
 - .1 In areas of sub-excavation, the asphalt shall be placed in two lifts of 62.5 mm thickness each.
 - .5 Spread and strike off mixture with self-propelled mechanical finisher:
 - .1 Construct longitudinal joints and edges true to line markings. Lines for paver to follow will be established by the Departmental Representative parallel to centerline of
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- proposed pavement. Position and operate paver to follow established line closely.
- .2 When using pavers in echelon, have first paver follow marks or lines, and second paver follow edge of material placed by first paver. Work pavers as close together as possible and in no case permit them to be more than 30 m apart.
 - .3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
 - .4 Correct irregularities in alignment left by paver by trimming directly behind machine.
 - .5 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute excess material forming high spots. Fill and smooth indented areas with hot mix. Do not broadcast material over such areas.
 - .6 Do not throw surplus material on freshly screeded surfaces.
- .6 When Hand Spreading is used:
- .1 Approved wood or steel forms, rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross section.
 - .2 Distribute material uniformly. Do not broadcast material.
 - .3 During spreading operation, thoroughly loosen and uniformly distribute material by lutes or covered rakes. Reject material that has formed into lumps and does not break down readily.
 - .4 After placing and before rolling, check surface with templates and straight edges and correct irregularities.
 - .5 Provide heating equipment to keep hand tools free from asphalt. Avoid high temperatures which may burn material. Do not use tools at a higher temperature than temperature of mix being placed.
- 3.6 Compacting
- .1 Roll asphalt continuously to a density not less than 93% of the mix maximum theoretical density.
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- .2 General:
 - .1 Provide minimum three (3) rollers and as many additional rollers as necessary to achieve specified pavement density. One roller must be pneumatic-tired type.
 - .2 Start rolling operations as soon as placed mix can bearing weight of roller without undue displacement of material or cracking of surface.
 - .3 Operate rollers slowly initially to avoid displacement of material. For subsequent rolling, do not exceed 5 km/h for static steel-wheeled rollers and 8 km/h for pneumatic-tired rollers.
 - .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 20 impacts per meter of travel.
 - .5 Overlap successive passes of roller by at least one half width of roller and vary pass lengths.
 - .6 Keep wheels of roller slightly moistened with water to prevent pick up of material, but do not over water.
 - .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism.
 - .8 Do to permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
 - .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.
 - .10 When paving in echelon, leave unrolled 50 to 75mm of edge which second paver is following and roll when joint between lanes is rolled.
 - .11 When rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.
 - .3 Breakdown Rolling:
 - .1 Commence breakdown rolling immediately following rolling of transverse and longitudinal joint and edges.
 - .2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue
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- displacement.
 - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. Exceptions may be made when working on steep slopes or superelevated sections.
 - .4 Second Rolling:
 - .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.
 - .2 Rolling shall be continuous after initial rolling until mix placed has been thoroughly compacted.
 - .5 Finish Rolling:
 - .1 Accomplish finish rolling with two-axle or three-axle tandem steel wheel rollers while material is still warm enough for removal of roller marks. If necessary to obtain desired surface finish, Departmental Representative shall specify use of pneumatic-tired rollers.
 - .2 Conduct rolling operations in close
- 3.7 Joints
- .1 General:
 - .1 Trim vertical face by sawcutting to provide true surface and cross section against which new pavement may be laid. Remove loose particles.
 - .2 Paint joint face with thin coat of hot asphalt cement or cut back asphalt or preheat joint face with approved heater, prior to placing of fresh mix.
 - .3 Overlap previously laid strip with spreader by 100mm.
 - .4 Remove surplus material from surface of previously laid strip. Do not dispose on surface of freshly laid strip.
 - .5 Construct joints between asphalt concrete pavement and Portland Cement concrete pavement as directed by Departmental Representative.
 - .6 Paint contact surfaces of existing structures such as manholes, curbs or gutters with
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- bituminous material prior to placing adjacent pavement.
- .2 Transverse Joints:
 - .1 Construct and thoroughly compact transverse joints to provide a smooth riding surface.
 - .2 Stagger joint locations 2 meters.
 - .3 Offset transverse joint in succeeding lifts by at least 600mm.
 - .3 Longitudinal Joints:
 - .1 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with a lute or rake.
 - .2 Roll longitudinal joints directly behind paving operation.
 - .3 When rolling with static roller, shift roller over onto previously placed lane in order that 100 to 150mm of drum width rides on newly laid lane, then operate roller to pinch and press fines gradually across joint. Continue rolling until thoroughly compacted neat joint is obtained.
 - .4 When rolling with static or vibratory roller, have most of drum width ride on newly placed lane with remaining 100 to 150mm extending onto previously placed and compacted lane.
 - .5 Offset longitudinal joints in succeeding lifts by at least 150mm.
 - .4 The use of feather joints shall not be permitted.
- 3.8 Finish Tolerances
- .1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.
 - .2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with a 4.5 m straight edge placed in any direction.
- 3.9 Defective Work
- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to specified density.
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- .2 Repair areas showing checking, rippling or segregation.
 - .3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.
- 3.10 Hours of Work
- .1 Unless specifically authorized otherwise by Departmental Representative, all spreading of asphalt mix shall stop at least ½ hour before sunset and the paver shall be off the road by sunset.

-- END OF SECTION --
