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| 1.1 DESCRIPTION OF WORK | .1 | The work under this contract involves the supply of all labour, materials and equipment required to demolish the existing wharf structure and construct the new wharf structure as detailed on the plan and in this specification. |
| | .2 | The work includes but is not limited to: <ul style="list-style-type: none"> .1 Site work including mobilization, demobilization, excavation, demolition and disposal. .2 Installation of timber piles, structural fill, geotextile membrane, and armor stone as detailed on the drawings and in the specification. .3 Supply and installation of concrete pile caps, precast concrete deck panels, all rough carpentry components, steel rung ladders and mooring devices as detailed on the drawings and in the specification. |
| | .3 | Site of Work is at: <u>North Lake, wharf structure 411 and 417, Kings Co, PE.</u> |
| 1.2 FAMILIARIZATION WITH SITE | .1 | Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the work. |
| | .2 | Obtain prior permission from the Departmental Representative and Harbor Authority before carrying out such site inspection. |
| 1.3 CODES AND STANDARDS | .1 | Perform work in accordance with any code of provincial or local application, including all amendments up to bid closing date, provided that in any case of conflict or discrepancy, the more stringent requirement shall apply. |

- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.4 INTERPRETATION OF DOCUMENTS

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

1.5 TERM ENGINEER

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.6 SETTING OUT WORK

- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.
- .2 Provide devices needed to lay out and construct work.
- .3 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 Supply stakes and other survey markers required for laying out work.

1.7 MEASUREMENT FOR PAYMENT

- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment.
- .2 Items included under "Measurement for payment"

Item 1: Mobilization and Demobilization:
Mobilization and demobilization shall constitute a lump sum for measurement purposes.

Item 2: Siteworks, Demolitions and Removals:
Demolition (including selective demolition) and removals shall constitute a lump sum for measurement purposes.

Item 3: Dredging:
Dredging shall constitute a price per cubic meter for measurement purposes.

Item 4: Timber Piles (supply and install):
Timber Piles shall be measured in units of linear meters installed.

Item 5: Rough Carpentry:
Rough carpentry shall include timber braces, wales, fenders, and wheel guards and shall constitute a lump sum for measurement purposes.

Item 6: Cast In Place Concrete:
Cast in place concrete shall include reinforced concrete pile caps and concrete deck panel enclosures and shall constitute a lump sum for measurement purposes.

Item 7: Precast Concrete:
Precast Concrete shall constitute a lump sum for measurement purposes.

Item 8: Excavation and Fills:
Excavation and fills shall be measured in units of tonnes.

Item 9: Armor Rock Filter Stone and Core Stone:
Armor rock and core stone shall be measured in units of tonnes.

Item 10: Geotextiles:
Geotextiles shall constitute a price per square meter for measurement purposes.

Item 11: Mooring Cleats:

Mooring Cleats shall constitute a price per mooring cleat.

Item 12: Ladders:

Ladders shall constitute a price per ladder.

1.8 DOCUMENTS
REQUIRED

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Reviewed Shop Drawings
 - .5 List of outstanding shop drawings
 - .6 Change Orders
 - .7 Other modifications to Contract
 - .8 Field Test Reports
 - .9 Copy of Approved Work Schedule
 - .10 Health and Safety Plan and other safety related documents
 - .11 Other documents as stipulated elsewhere in the Contract Documents.

1.9 PERMITS

- .1 In accordance with the the General Conditions, obtain and pay for building permit, certificates, licenses and other permits as required by municipal, provincial and federal authorities.
- .2 Provide appropriate notifications of project to municipal and provincial inspection authorities.
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.
- .4 Submit to Departmental Representative, copy of application forms and approval documents received from above referenced authorities.

1.10 ALTERATIONS,
ADDITIONS OR
REPAIRS TO EXISTING
BUILDING

- .1 Execute work with least possible interference or disturbance to Harbour operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- .2 Where security has been reduced by work of Contract, provide temporary means to maintain security.
- .3 Provide barriers and warning signs in locations where work is adjacent to areas which will be operative during such work.

1.11 CUTTING,
FITTING AND
PATCHING

- .1 Ensure that cutting and patching required by all trades is included in total bid price submitted for the work.
- .2 Execute cutting, including excavation, fitting and patching required to make work fit properly.
- .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .4 Do not cut, bore, or sleeve load-bearing members, except where specifically approved by Departmental Representative.
- .5 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

- 1.12 EXISTING
SERVICES
- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to operations.
 - .2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
 - .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. This includes disconnection of electrical power. Adhere to approved schedule and provide notice to affected parties.
 - .4 Provide temporary services when directed by Departmental Representative to maintain critical systems.
 - .5 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
 - .6 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

1.1 SUBMITTALS

- .1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:
 - .1 Work Schedule as specified herein.
 - .2 Waste Management Plan specified in section 01 74 21.
 - .3 Environmental Plan specified in section 01 35 44.
 - .4 Health and Safety Plan specified in section 01 35 29.

1.2 WORK SCHEDULE

- .1 Upon acceptance of bid submit:
 - .1 Work schedule within 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 (GANTT) 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 within designated time.
 - .3 Generally Bar Charts derived from

commercially available computerized project management system are preferred but not mandatory.

- .5 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified below and 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 subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
- .9 Schedule Updates:
 - .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.

1.3 PROJECT PHASING

- .1 Be aware that the harbor must be kept operational for the full duration of work of this contract.

1.4 OPERATIONAL RESTRICTIONS

- .1 The Contractor must recognize that harbor users will be affected by implementation of this contract. The Contractor must perform the work with utmost regard to the safety and convenience of building occupants and 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 structure without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.
- .2 Contractor to meet with the Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.
- .3 Safety Signage:
 - .1 Provide on site, and erect as required during progress of work, proper signage, mounted on self-supporting stands, warning the public of construction activities progress and alerting need to exercise caution in the area.
 - .2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.

.3 Include costs for the supply and installation of these signs in the bid price.

.4 Stock pile materials on site in a location that does not affect the normal operation of the harbor and is agreed upon by the departmental representative and the local Harbor Authority.

.5 Dust and Dirt Control:

.1 See section 01 50 00 and 01 74 11 for dust control and cleaning requirements.

.2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.

.3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.

.4 As work progresses, maintain construction areas in a tidy condition at all times.

1.5 PROJECT MEETINGS

.1 Schedule and administer project meetings, held on a minimum monthly basis, for entire duration of work and more often when directed by Departmental Representative as deemed necessary due to progress of work or particular situation.

.2 Prepare agenda for meetings.

.3 Notify participants in writing 4 days in advance of meeting date.

.1 Ensure attendance of all subcontractors.

.2 Departmental Representative will provide list of other attendees to be notified.

.4 Hold meetings at project site or where approved by Departmental Representative.

- .5 Preside at meetings and record minutes.
 - .1 Indicate significant proceedings and decisions. Identify action items by parties.
 - .2 Distribute to participants by mail or by facimile within 2 calendar days after each meeting.
 - .3 Make revisions as directed by Departmental Representative.
 - .4 Departmental Representative will advise whether submission of minutes by Email is acceptable. Decision will be based on compatibility of software among participants.

1.6 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 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 own cost.

1.1 RELATED
SECTIONS

.1 Section 01 78 00 - Closeout Submittals.

1.2 SUBMITTAL
GENERAL REQUIREMENTS

- .1 Submit to Departmental Representative for review requested submittals specified in various sections of the specifications including shop drawings, samples, permits, compliance certificates, test reports, work management plans and other data required as part of the work.
- .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.
- .3 Do not proceed with work until relevant submissions have been reviewed.
- .4 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .5 Where items or information is not produced in SI Metric units, provide soft converted values.
- .6 Review submittals prior to submission. Ensure that necessary requirements have been determined and verified and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
 - .1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.
- .7 Verify field measurements and affected adjacent Work are coordinated.

- .8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .9 Contractor's responsibility for errors, omissions or deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.
- .10 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.
- .11 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.
- .12 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work.

- .2 Shop Drawing Quantities: submit sufficient copies required by the General Contractor and sub-contractors plus 3 copies which will be retained by Departmental Representative.
- .3 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.
- .4 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.
 - .2 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
 - .3 Delete information not applicable to project on all submittals.
- .5 Allow 14 calendar days for Departmental Representative's review of each submission.
- .6 Adjustments or corrections made on shop

drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.

- .7 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.
- .8 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.
- .9 Accompany each submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and project number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .10 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and project number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized Representative certifying approval of submissions, verification of field measurements and

compliance with Contract Documents.

.5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.

.6 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, 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.

.11 After Departmental Representative's review, distribute copies.

.12 The review of shop drawings by the Departmental Representative or by an authorized Consultant or designate is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Canada approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of the construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

1.4 SAMPLES

- .1 Submit for review samples as specified in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples to 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 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments will result in a cost increase to the Contract notify Departmental Representative in writing prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

- 1.1 SECTION INCLUDES
- .1 Fire Safety Requirements
 - .2 Hot Work Permit
 - .3 Existing Fire Protection and Alarm Systems
- 1.2 RELATED WORK
- .1 Section 01 35 29 Health and Safety Requirements
- 1.3 REFERENCES
- .1 Fire Protection Standards issued by Fire Protection Services, Labour Program Division of Service Canada:
 - .1 FCC No. 301-June 1982 Standard for Construction Operations.
 - .2 FCC No. 302-June 1982 Standard for Welding and Cutting.
 - .2 FCC standards may be viewed at:
 - .1 <http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.shtml>
 - .2 Fire Protection Services - Atlantic Region office, Halifax, N.S, Tel. (902) 426-6053.
- 1.4 DEFINITIONS
- .1 Hot Work defined as:
 - .1 Cutting of materials by use of torch or other open flame devices
 - .2 Grinding with equipment which produces sparks.
- 1.5 SUBMITTALS
- .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days of acceptance of bid.
 - .2 Submit in accordance with section 01 33 00.

1.6 FIRE SAFETY
REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with 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.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.7 HOT WORK
AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented and followed during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities, each activity requiring a separately written authorization

to proceed.

- .4 Requirement for individual authorization will be based on:
 - .1 Nature or phasing of work;
 - .2 Risk to Facility operations;
 - .3 Quantity of various trades needing to perform hot work on project or;
 - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .6 In tenant occupied Facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed, perform Hot Work only during non-operative hours of the Facility. Follow Departmental Representative's directives in this regard.

1.8 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Hot Work Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in section 01 35 29.
 - .2 Use of a Hot Work Permit system 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 30 minutes immediately following the completion of the Hot Work.

.5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.

.6 Site specific rules and procedures in force at the site as provided by the Facility Manager.

.3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Label document as being the Hot Work Procedures for this contract.

.4 Procedures shall clearly establish responsibilities of:

- .1 Worker performing hot work,
- .2 Person issuing the Hot Work Permit,
- .3 Fire Safety Watcher,
- .4 Subcontractor(s) and Contractor.

.5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.

.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.

1.9 HOT WORK PERMIT

.1 Hot Work Permit to include the following:

- .1 Project name and project number;
- .2 Building name and specific room or area

where hot work will be performed;

.3 Date of issue;

.4 Description of hot work type needed;

.5 Special precautions to be followed,
including type of fire extinguisher needed;

.6 Name and signature of permit issuer.

.7 Name of worker to which the permit is
issued.

.8 Permit validity period not to exceed 8
hours. Indicate start time/date and
termination time/date.

.9 Worker's signature with time/date of hot
work completion.

.10 Stipulated time period of safety watch.

.11 Fire Safety Watcher's signature with
time/date.

.2 Permit to be typewritten form. Industry
Standard forms shall only be used if all data
specified above is included on form.

.3 Each Hot Work Permit to be completed in full,
signed and returned to Contractor's
Superintendent for safe keeping on site.

1.10 FIRE PROTECTION
AND ALARM SYSTEMS

.1 Fire protection and alarm systems shall not
be:

.1 Obstructed.

.2 Shut-off, unless approved by
Departmental Representative.

.3 Left inactive at the end of a working day
or shift.

.2 Do not use fire hydrants, standpipes and hose
systems for purposes other than firefighting.

.3 Costs incurred, from the fire department,
Facility owner and tenants, resulting from
negligently setting off false alarms will be
charged to the Contractor in the form of
financial progress payment reductions and
holdback assessments against the Contract.

1.11 DOCUMENTS
ON SITE

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

- 1.1 RELATED WORK .1 Submit to Departmental Representative copies of the following documents, including updates:
- .1 Site Specific Health and Safety Plan.
 - .2 Building Permit, compliance certificates and other permits obtained.
 - .3 Reports or directions issued by Federal, Provincial or other authority having jurisdiction.
 - .4 Accident or Incident Reports.
 - .5 MSDS data sheets.
 - .6 Name of Contractor's Representative designated to perform full time health and safety supervision on site.
- .2 Upon request by Departmental Representative, submit reports and other documentation as stipulated to be produced and maintained by Federal and Provincial Occupational Health and Safety Regulations and as specified herein.
- .3 Submit above documents in accordance with the submittal procedures specified in Section 01 33 00.
- .4 Section 01 35 24: Special Procedures on Fire Safety Requirements.
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- 1.2 DEFINITIONS/
COMPLIANCE
REQUIREMENTS .1 Comply with the Occupational Health and Safety Act for the Province of Prince Edward Island, and the Occupational Health and Safety Act Regulations made pursuant to the Act.
- .2 COSH: Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.

- .3 Observe and enforce construction safety measures required by:
 - .1 National Building Code of Canada;
 - .2 Provincial Worker's Compensation Board;
 - .3 Municipal statutes and ordinances.
- .4 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.
- .5 A copy of the Canada Labour Code Part II may be obtained by contacting:

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)
- .6 Maintain Workers Compensation Coverage for duration of Contract. Submit Letter of Good Standing to Departmental Representative upon request.
- .7 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 the occupational health and safety statutes and regulations that apply to the work and;
 - .3 Knowledgeable about potential or actual danger to health and safety associated with the work.
- .8 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.

.9 PPE: personal protective equipment

.10 Work Site: where used in this section shall mean areas, located at the premises where work is undertaken, used by Contractor to perform all of the activities associated with the performance of the work.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific health and safety plan prior to commencement of work.
- .3 Review section 1.12 Health and Safety Plan.

1.4 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, of property and for protection of persons and public circulating adjacent to work operations to extent that they may be affected by conduct of the Work.
- .2 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 statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.5 SITE CONTROL AND ACCESS

- .1 Control work site and entry points to construction areas.
 - .1 Delineate and isolate construction areas from other areas of site by use of appropriate means.
 - .2 Post notices and signage at entry points

and at other strategic locations identifying entrance onto site to be restricted to authorized persons only.

.3 Signage must be professionally made, bilingual in both official languages or display internationally understood graphic symbols.

.2 Approve and grant access to site only to workers and authorized persons.

.1 Immediately stop non-authorized persons from circulating in construction areas and remove from site.

.2 Provide site safety orientation to all persons before granting access. Advise of site conditions, hazards and mandatory safety rules to be observed on site.

.3 Secure site at night time to extent required to protect against unauthorized entry. Provide security guard where protection cannot be achieved by other means.

.4 Ensure persons granted access to site wear appropriate personal protective equipment (PPE) suitable to work and site conditions.
.1 Provide such PPE to authorized persons who require access to perform inspections or other approved purposes.

1.6 PROTECTION

.1 Carry out work placing emphasis on health and safety of the Public, Facility personnel, construction workers and protection of the environment.

.2 Erect safety barricades, lights and signage on site to effectively delineate work areas, protect pedestrian and vehicular traffic around and adjacent to work and to create a safe working environment.

.1 Erect fences, hoarding protective barrier and temporary lighting as required.

See Section 01 50 00 for minimum acceptable barricades.

- .3 Should unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.7 FILING OF NOTICE

- .1 File Notice of Project and other Notices with Provincial authorities prior to commencement of Work.
 - .1 Departmental Representative will assist in locating address for Filing Notice of Project if needed.

1.8 PERMITS

- .1 Post on site permits, licenses, compliance certificates specified in section 01 10 10.
- .2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain his/her approval to proceed before carrying out that portion of work.

1.9 HAZARD ASSESSMENTS

- .1 Conduct site specific health and safety hazard assessment before commencing project and during course of the work. Identify risks and hazards resulting from site conditions, weather conditions and work operations.
 - .1 Perform on-going assessments addressing new risks and hazards as work progresses including when new subtrade or subcontractor arrives on site.
 - .2 Also, conduct assessment when the scope of work has been changed by Change Order and when potential hazard or weakness in current

health and safety practices are identified by Departmental Representative or by an authorized safety Representative.

- .2 The following are known or potential project related safety hazards at site:
 - .1 overhead wiring
 - .2 vehicle traffic
 - .3 uneven road conditions
 - .4 working over water
 - .5 unstable ground conditions
 - .6 load limits on wharf structures
- .3 Above lists shall not be constructed as being complete and inclusive of safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.
- .4 Record results in writing and address in Health and Safety Plan.
- .5 Keep copy of all assessments on site.

1.10 PROJECT/SITE
CONDITIONS

- .1 Obtain from Departmental Representative, copies of all MSDS Data sheets for existing hazardous products stored on site or used by Facility personnel.
- .2 Obtain from supplier all MSDS Data sheets for construction products and provide a copy easily accessible to all people access the site.

1.11 HEALTH AND
SAFETY MEETINGS

- .1 Attend pre-construction health and safety Meeting conducted by Departmental Representative. Have following persons in attendance:
 - .1 Site Superintendent.
 - .2 Contractor's designated Health and

Safety Site Supervisor.

- .4 Departmental Representative will advise of date, time and location.
- .2 Conduct health and safety meetings and tool box briefings on site. Hold on a regular and pre-scheduled basis during entire work in accordance with requirements and frequency as stipulated in provincial occupational health and safety regulations.
 - .1 Keep workers informed of potential hazards and provide safe work practices and procedures to be followed.
 - .2 Take written minutes and post on site.

1.12 HEALTH AND SAFETY PLAN

- .1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.
 - .1 Submit copy to Departmental Representative within 7 calendar days of acceptance of bid.
 - .2 Submit updates as work progresses.
- .2 Health and Safety Plan shall contain three (3) parts with following information:
 - .1 Part 1 - Hazards: List of individual health risks and safety hazards identified by hazard assessment process.
 - .2 Part 2 - Safety Measures: engineering controls, personal protective equipment and safe work practises used to mitigate hazards and risks listed in Part 1 of Plan.
 - .3 Part 3a: Emergency Response: standard operating procedures, evacuation measures and emergency response in the occurrence of an accident, incident or emergency.
 - .1 Include response to all hazards listed in Part 1 of Plan.
 - .2 Evacuation measures to complement the Facility's existing Emergency Response and Evacuation Plan. Obtain

pertinent information from Departmental Representative.

.3 List names and telephone numbers of officials to contact including:

.1 General Contractor and all Subcontractors.

.2 Federal and Provincial Departments as stipulated by laws and regulations and local emergency resource organizations, as needed based on nature of emergency or accident.

.3 Officials from PWGSC and site Facility management. Departmental Representative will provide list.

.4 Part 3b - Site Communications:

.1 Procedures used on site to share work related safety issues between workers, subcontractors, and General Contractor.

.2 List of critical tasks and work activities, to be communicated with the Facility Manager, which has risk of affecting tenant operations, or endangering health and safety of Facility personnel and the general public. Develop list in consultation with the Departmental Representative.

.3 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

Column 1 Part 1	Column 2 Part 2	Column 3 Part 3a/3b
Identified Hazards	Safety Measures	Emergency Response Site Communications

- .4 Develop Plan in collaboration with subcontractors. Address work activities of all trades. Revise and update Plan as Sub-contractors arrive on site.
- .5 Implement and enforce compliance with requirements of Plan for full duration of work to final completion and demobilization from site.
- .6 As work progresses, review and update Plan. Address additional health risks and safety hazards identified by on-going hazard assessments.
- .7 Post copy of Plan, and updates, on site.
- .8 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part or in whole of such Plan by Departmental Representative and shall not be interpreted as a warranty of being complete and accurate or as a confirmation that all health and safety requirements of the Work have been addressed and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation.

1.13 SAFETY SUPERVISION AND INSPECTIONS

- .1 Designate one person to be present on site at all times, responsible for supervising health and safety of the Work.
 - .1 Person to be competent in Occupational Health and Construction Safety as defined in

the Provincial Occupational Health and Safety Act.

- .2 Assign responsibility, obligation and authority to such designated person to stop work as deemed necessary for reasons of health and safety.
- .3 Conduct regularly scheduled informal safety inspections of work site on a minimum bi-weekly basis.
 - .1 Note deficiencies and remedial action taken in a log book or diary.
- .4 Keep inspection reports on site.

1.14 TRAINING

- .1 Ensure that all workers and other persons granted access to site are competently trained and knowledgeable on:
 - .1 Safe use of tools and equipment.
 - .2 How to wear and use personal protective equipment (PPE).
 - .3 Safe work practices and procedures to be followed in carrying out work.
 - .4 Site conditions and minimum safety rules to be observed on site, as given at site orientation session.

1.15 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements to be obeyed by all persons granted site access:
 - .1 Wear personnel protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, safety footwear and eye protection.
 - .2 Immediately report unsafe activity or condition at site, near-miss accident, injury and damage.
 - .3 Maintain site in tidy condition.
 - .4 Obey warning signs and safety tags.
- .2 Brief workers on site safety rules and on

disciplinary measures to be taken by Departmental Representative for violation or non-compliance of such rules. Post rules on site.

- .3 The following actions or conduct by Contractor, workers and subcontractors will be considered as non-conformance with the health and safety requirements of the contract for which a Non-Compliance Notification will be issued to the General Contractor by the Departmental Representative:
 - .1 Failure to follow the minimum site safety rules specified above.
 - .2 Negligence resulting in serious injury or major property damage.
 - .3 Deliberate non-compliance with Federal and Provincial Acts and Regulations.
 - .4 Falsification of information in Workers Compensation Reports, safety reports and other health and safety related documents submitted to Departmental Representative or to Authority having jurisdiction.
 - .5 Possession of firearms on site.
 - .6 Possession of non-prescriptive illegal drugs or alcohol.
 - .7 Action, or lack thereof, resulting in the issuance of Warnings, Fines or Stop Work Orders from a Provincial Authority having jurisdiction.
 - .8 Violation of other specified health and safety rules and requirements as determined by Departmental Representative.

- .4 See elsewhere in this section for details on Non-Compliance Notifications and resulting disciplinary measures.

1.16 INCIDENT
REPORTING

- .1 Investigate and report the following incidents:
 - .1 Those as required by Provincial Occupational Safety and Health Act and

Regulations.

.2 Injury requiring medical aid as defined in the Canadian Dictionary of Safety Terms-1987, published by the Canadian Society of Safety Engineers (C.S.S.E)as follows:

.1 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.

.3 Property damage in excess of \$5000.00,

.4 Interruption to Facility operations.

.5 Those which require notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable law or regulations.

.2 Send written report to Departmental Representative for all above cases.

1.17 TOOLS AND EQUIPMENT SAFETY

.1 Routinely check and maintain tools, equipment and machinery for safe operation.

.2 Conduct checks as part of site safety inspections. When requested, submit proof that checks and maintenance have been carried out.

.3 Tag and immediately remove from site items found faulty or defective.

1.18 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).

.2 Keep MSDS data sheets for all products delivered to site. Post on site. Submit copy to Departmental Representative upon receipt.

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| <u>1.19 POWDER ACTUATED DEVICES</u> | .1 | Use powder actuated fastening devices only after receipt of written permission from Departmental Representative. |
| <u>1.20 CONFINED SPACES</u> | .1 | Carry out work in confined spaces in compliance with: <ul style="list-style-type: none"> .1 Provincial Occupational Safety and Health Regulations and; .2 Canada Occupational Safety and Health Regulations (COSH) made under the Canada Labour Code - Part II. |
| | .2 | Conduct hazard assessment and address in Safety Plan before entering confined space. |
| | .3 | Provide and maintain equipment and PPE as required for the safety and emergency evacuation of persons entering confined spaces. |
| | .4 | Provide training to persons who will be entering and to those persons who will be assisting in the confined space entry process. Training to be specialized instructions beyond (basic confined space entry information) as required to suit type and conditions of confined space. |
| | .5 | Safety for Inspectors: <ul style="list-style-type: none"> .1 Upon request, provide PPE and training to Departmental Representative and to other authorized persons, for the purpose of entering confined space to conduct inspections. .2 Be responsible for the efficacy of the equipment and safety of such persons during their entry and occupancy in the confined space. |
| <u>1.21 POSTING OF DOCUMENTS</u> | .1 | Post on site safety documentation as stipulated by Authorities having jurisdiction and as specified herein. Place in a common visible location. |

- 1.22 SITE RECORDS
- .1 Maintain on site a copy of all health and safety documentation and reports specified to be produced as part of the work and received from authorities having jurisdiction.
 - .2 Upon request, make available to Departmental Representative and to other authorized safety representative for review. Provide copy when directed by Departmental Representative.
- 1.23 NON COMPLIANCE AND DISCIPLINARY MEASURES
- .1 Immediately address and correct 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 are not corrected in a timely manner.

1.1 RELATED WORK

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

1.2 REFERENCES

- .1 WHMS: Workplace Hazardous Materials Information System, Health Canada.
- .2 Transportation of Dangerous Goods Act. Transport Canada, amended 2011-11-09.
- .3 Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, Department of Fisheries and Oceans Canada, 1998.
- .4 MBCA: Migratory Birds Convention Act, Environment Canada, 1994.
- .5 Canadian Coast Guard Regulations, Department of Fisheries and Oceans Canada.
- .6 Canadian Shipping Act, Transport Canada, 2001.
- .7 AWWPA: American Wood Preserver Association

1.3 DEFINITIONS

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

1.4 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 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.

1.6 HAZARDOUS
MATERIAL HANDLING

- .1 Handle and store hazardous materials on site in accordance with WHMIS procedures and requirements.
- .2 Store all hazardous liquids in location and manner to prevent their spillage into the environment.
- .3 Maintain written inventory of all hazardous materials kept on site. List product name, quantity and storage date.
- .4 Keep MSDS data sheets on site for all items.

1.7 PETROLEUM, OIL
AND LUBRICANTS

- .1 Comply with Federal and Provincial laws, regulations, codes and guidelines for the storage of fuel and petroleum products on site.
- .2 Do not place fuel storage tanks and store fuel or other petroleum products within a 30 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.
- .3 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .4 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.
- .5 Maintain on site appropriate emergency spill response equipment consisting of at least one 250-litre (55 gallon) overpack spill kit for

containment and cleanup of spills.

- .6 Maintain vehicles and equipment in good working order to prevent leaks on site.
- .7 In the event of a petroleum spill, immediately notify the Departmental Representative and the Canadian Coast Guard (CCG) at 1-800-565-1633 (24 hour report line). Perform clean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.

1.8 DISPOSAL OF WASTES

- .1 Do not bury rubbish, demolition debris and waste materials on site.
- .2 Dispose and recycle demolition debris and waste materials in accordance with project waste management requirements specified in section 01 74 21.
- .3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc...) and petroleum products into waterways, storm or sanitary sewers or in waste landfill sites.
- .4 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
- .5 Concrete waste:
 - .1 Do not discharge residual or rejected concrete on site.
 - .2 Immediately clean any accidental release of concrete on site prior to solidification.
 - .3 Do not wash and clean concrete vehicles on site.
 - .4 Perform dumping of residual material and truck cleaning operations only at the concrete plant. Follow environmental

regulations and good practices as approved by the Provincial Department of the Environment and other authorities having jurisdiction.

- 1.9 WATER QUALITY .1 Conduct excavation work of a watercourse or wetland in such a manner to limit turbidity and reduce sediment suspension in the water to an absolute minimum at all times.
- .1 Maintain appropriate production speed and momentum of the excavation equipment. Make adjustments as required and as approved by Departmental Representative.
 - .2 Strategically position excavator equipment and haul vehicles to avoid over the water swings of excavated material whenever possible.
- .2 Where work may affect the water quality adjacent to water intake lines used by Lobster Holding Facilities, Fish Processing Facilities and other harbour users, schedule work in cooperation with the Harbour Authority as directed by Departmental Representative to minimize interference and impact to harbour users.
- .3 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 AWPA approved.

.5 Do not use timber and lumber treated with creosote, petroleum and pentachlorophenol for any part of the Work.

.4 Do not wash down equipment within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.

1.10 SOCIOECONOMIC RESTRICTIONS

- .1 Must 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 Equip 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.

1.11 BIRD AND BIRD HABITAT

- .1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regards to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Must minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.
- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .4 During 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 neighboring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.12 FISH AND FISH HABITAT

- .1 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.
- .2 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.
- .3 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.
- .4 Conduct cleaning and washing operations as follows:

- .1 Scrap 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.
- .5 Do not perform cleaning and wash down within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- .6 Record of Assurance Logbook:
 - .1 Maintain an on-going log of past and present usage and wash down of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
 - .2 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 wash down for each piece of equipment;
 - .4 Cleaning method and cleaning agent(s) used.
- .7 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.

- .8 Abide by requirements and recommendations of the Federal Department of Environment and the Department of Fisheries and Oceans - Habitat Protection and Sustainable Development Branch in cleaning and wash down of equipment.

1.13 AIR QUALITY

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

1.14 FIRES

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

1.1 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.2 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
 - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
- .2 At completion of tests, turn over 2 sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
 - .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00.
- .3 Unspecified tests may also be made by

Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.

- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required verifying acceptability of corrected work.

1.3 INDEPENDENT INSPECTION AGENCIES

- .1 Departmental Representative may engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of mechanical and electrical equipment and other building systems.
 - .4 Performance verification tests before building commissioning procedures commences.
 - .5 Mill tests and certificates of compliance.
 - .6 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
 - .7 Additional tests as specified in Clause 1.3.4 above.
- .2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental

Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.

- .3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .4 Provide labour and facilities to obtain, handle and deliver samples.
- .5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.
- .6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

1.4 ACCESS TO WORK

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

- 1.5 REJECTED WORK
- .1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
 - .2 Make good damages to new and existing construction and finishes resulting from removal or replacement of defective work.
- 1.6 MOCK-UPS
- .1 Prepare mock-ups of certain work as specified in various sections of the Specifications. Include in each mock-up all related work components representative of final assembly.
 - .2 Construct in locations acceptable to Departmental Representative.
 - .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
 - .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
 - .5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.
 - .6 Dismantle and remove mock-up when directed by Departmental Representative, unless approval is given for mock-up to remain as part of the Work.

1.1 SITE ACCESS
AND PARKING

- .1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.
- .2 The Contractor is advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.
- .3 Parking facilities at site is limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.
- .4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.
- .5 Maintain 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.

1.2 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.

1.3 MATERIAL STORAGE .1 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.

1.4 SITE ENCLOSURES

- .1 Provide temporary fence to enclose various construction areas of work site.
- .2 Erect plastic mesh fence constructed as follows:
 - .1 1200 mm height, constructed of high density polyethylene mesh fence fabric, orange in color.
 - .2 Supported by steel T-bar posts or other similar framing, of sufficient quantity, adequate spacing and set firmly in ground to secure fence against sags.
 - .3 Inspect fence regularly, repairing sags and damaged sections.
 - .4 Incorporate within fence one operable truck gate and one pedestrian gate.
- .3 Make all gates lockable and provide keyed padlocks.
- .4 Obtain Departmental Representative's approval beforehand of location and layout of all temporary fence enclosures.
- .5 Provide battery powered lanterns around the perimeter of the site enclosure to clearly mark its location at night.
- .6 Provide warning signs affixed to all fenced areas, identifying those enclosed areas as "Construction Zones" with access restricted to only those persons so authorized by General Contractor.
- .7 Do not construe fencing as an acceptable replacement for pedestrian walkway and

hoarding requirements specified below.

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| 1.5 PEDESTRIAN
WALKWAYS AND
HOARDING | .1 | Ensure maximum safety and security to facility users during the course of work. |
| | .2 | Maintain access and egress to building entrances and fire exits to remain in use. |
| | .3 | Adequately frame and brace [hoarding] [and walkways] to resist wind, and other weather or site conditions. |
| | .4 | Erect such protective devices during Facility's non-operational off hour periods. |
| | .5 | Obtain Departmental Representative's concurrence prior to removal of hoarding and walkways. |
| 1.6 SANITARY
FACILITIES | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances. |
| | .2 | Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| | .3 | Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Departmental Representative. |
| 1.7 ENCLOSURE OF
STRUCTURE | .1 | Design enclosures to withstand wind pressure and snow loading. |
| 1.8 POWER | .1 | Power supply is available and will be provided for construction usage. |

- .1 Make arrangements for the use of such services through the Departmental Representative.
- .2 Departmental Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.
- .3 Connect to existing power supply in accordance with Canadian Electrical Code.

- .2 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162 lx in all locations.
- .3 Electrical power and lighting systems installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used over period of 3 months.

1.9 WATER SUPPLY

- .1 Water supply is available on site and will be provided for construction usage at no cost. Make arrangements for the use and transportation of such services to work area through the Departmental Representative.

1.10 CONSTRUCTION SIGN AND NOTICES

- .1 Upon request by Departmental Representative, erect a self supporting project sign in location indicated.
- .2 Departmental Representative will provide a vinyl sign facing for installation by Contractor on sign framework. Sign frame to be plywood face of approximately 1200 x 2400 mm in size complete with required wood framing at 400 mm o.c and support posts.
- .3 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.

- .4 Contractor or subcontractor advertisement signboards are not permitted on site.
- .5 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN3-Z321-96(R2006).
- .6 Maintenance and Disposal of Site Signs:
 - .1 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.11 REMOVAL OF
TEMPORARY
FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 7 days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Compliance to specified standards.
 - .5 Manufacturer's installation or application instructions.
 - .6 Evidence of arrangements to procure.
 - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .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.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 PRODUCT QUALITY

- .1 Contractor shall be solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
- .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions of

the Contract.

1.3 ACCEPTABLE
MATERIALS AND
ALTERNATIVES

- .1 Acceptable Materials: When materials specified include trade names or trade marks or manufacturer's or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.
- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.
- .3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

1.4 MANUFACTURERS
INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturers instructions, so that Departmental Representative will designate which document is to be followed.

1.5 AVAILABILITY

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2 above.

1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.
- .3 Ensure cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate work between trades and subcontractors. See section 01 14 10 in this regard.
- .5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS - GENERAL

- .1 Use non-corrosive fasteners, anchors and spacers for securing work.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See section on Health and Safety Requirements in this regard.

1.8 FASTENINGS -
EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and galvanized finish.

1.9 STORAGE,
HANDLING AND PROTECTION

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

Departmental Representative's satisfaction.
Use touch-up materials to match original. Do
not paint over name plates.

1.10 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.

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| <u>1.1 GENERAL</u> | .1 | Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. |
| | .2 | Store volatile waste in covered metal containers, and remove from premises at end of each working day. |
| | .3 | Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose. |
| <u>1.2 MATERIALS</u> | .1 | Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer. |
| <u>1.3 CLEANING DURING CONSTRUCTION</u> | .1 | Maintain work site in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis. |
| | .2 | Provide on-site containers for collection of waste materials and debris. |
| | .3 | Use separate collection bins, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified. |
| | .4 | Remove waste materials, and debris from site on a minimum weekly basis. |
| | .5 | 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 In preparation for acceptance of the completed work perform final cleaning.
 - .2 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
 - .3 Remove debris and surplus materials from site.

1 DEFINITIONS

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

2 WASTE MANAGEMENT

- .1 Incorporate environmental and sustainable practises in managing waste resulting from work.
- .2 Divert as much waste as possible from landfill.
- .3 Coordinate work of subtrades and subcontractors to ensure all possible waste reduction and recycling opportunities are taken. Follow waste management requirements specified in trade sections of the Specifications.
- .4 Reduce waste during installation of new materials. Undertake practices which will optimize full use of materials and minimize waste.
- .5 Develop innovative procedures to reduce quantity of waste generated by construction such as by delivering materials to site with minimal packaging etc...
- .6 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
- .7 During demolition and removal work separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:

- .1 Reinstallation into the work where indicated.
- .2 Salvaging reusable items not needed in project which Contractor may sell to other parties.
- .3 Sending as many items as possible to locally available recycling facility.
- .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.

- .8 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .9 Send leftover material resulting from installation work for recycling whenever possible.
- .10 Establish methods whereby hazardous and toxic materials, and their containers used on site are properly handled, stored and disposed in accordance with applicable federal, provincial and municipal laws and regulations.

3 DISPOSAL REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of volatile materials, mineral spirits, oil, paint, and other hazardous materials 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, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.

- .5 Transport and dispose of waste intended for waste processing plant or landfill facility in separated condition and to Operator's rules and recommendations in support of their effort to recycle, reduce and divert certain waste stream from general landfill.
- .6 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.
- .7 Sale of salvaged items by Contractor to other parties not permitted on site.

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| 1.1 SECTION
<u>INCLUDES</u> | .1 | Administrative procedures preceding inspection and acceptance of Work by Departmental Representative. |
| 1.2 RELATED
<u>SECTIONS</u> | .1 | Section 01 78 00 - Closeout Submittals. |
| 1.3 INSPECTION AND
<u>DECLARATION</u> | .1 | Contractor's Inspection: Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.

.1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work. |
| | .2 | Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.
.1 Address defects, faults and outstanding items of work identified by such inspections.
.2 Advise Departmental Representative when all deficiencies identified have been rectified. |
| | .3 | Note that Departmental Representative will not issue a Certificate of Substantial |

Performance of the work until such time that Contractor performs following work and turns over the specified documents:

- .1 Project record as-built documents;
- .2 Reports resulting from designated tests;

- .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

1.1 SECTION
INCLUDES

.1 Project Record Documents.

1.2 PROJECT RECORD
DOCUMENTS

- .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 following information:
 - .1 Horizontal and vertical location of various elements in relation to chart Datum;
 - .2 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
 - .3 Field changes of dimension and detail;

- .4 Location of all capped or terminated services and utilities.
- .5 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
- .6 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 As-built Specifications: legibly mark in red each item to record actual construction, including:
 - .1 Changes made by Addenda and Change Orders.
 - .2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to drawings as per above clause.
- .6 Maintain As-built documents 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.

1.3 REVIEWED
SHOP DRAWINGS

- .1 Provide a complete set of all shop drawings reviewed for project to incorporate into each copy of the Operations & Maintenance manuals.
- .2 Submit full sets at same time and as part of the contents of the Operation and Maintenance manuals specified.

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| <u>1. Description of Work</u> | This Section includes but is not limited to the following: |
| | .1 All demolition and removals as required to complete the work. All items to be verified by a site visit prior to submission of a tender. All available plans of the existing structure are available for viewing at PWGSC office, 3 Queen Street, Charlottetown, P.E. |
| <u>1.2 Related Work</u> | .1 Refer to other specification sections for related information. |
| | .2 Refer to Section 01 33 00 for Submittal Procedures. |
| <u>1.3 Submissions</u> | .1 Methodology:
.1 When requested, provide methodology for carrying out the work. |
| | .2 Provide submissions in accordance with Section 01 33 00. |
| <u>1.4 Protection</u> | .1 Prevent movement, settlement or damage of adjacent structures. Provided bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of a <i>Departmental Representative</i> and at no additional cost. |
| | .2 Prevent debris from entering harbour and creating navigational hazards. |
| | .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 a <i>Departmental Representative</i> . |

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| <u>1.5 Measurement of Payment</u> | .1 | Demolition and removals will be measured in accordance with Section 01 10 10 and shall include demolitions, selective demolitions, removals, transportation, disposal, environmental protective measures, and site cleanup. |
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PART 2 - PRODUCTS Not applicable.

PART 3 - EXECUTION

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| <u>3.1 Preparation</u> | .1 | Inspect site and verify with a <i>Departmental Representative</i> items designated for removal and items to be preserved. |
| | .2 | Do not disturb adjacent structures designated to remain in place. |

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| <u>3.2 Removal</u> | .1 | Remove items indicated. |
| | .2 | Do not disturb adjacent structures designated to remain in place. |
| | .3 | At end of each day's work, leave work in safe condition so no part is in danger of toppling or failing. |
| | .4 | Excavate to extents and dimensions indicated on the drawings. |

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| <u>3.3 Disposal of Material</u> | .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. |
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.2 The material to be disposed is to be transported and disposed of in an environmentally acceptable manner to the satisfaction of a *Departmental Representative*, and in accordance with any local, Municipal, Provincial and Federal restrictions and regulations.

.3 All creosote materials to be disposed of at land fill located in Wellington, PE.

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.

PART 1 - GENERAL

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| <u>1.1 Related Work</u> | .1 | Refer to other Specification Sections for related information. |
| | .2 | Refer to Section 01 33 00 for Shop Drawing/Submissions requirements. |
| <u>1.2 Reference Standards</u> | .1 | Construct concrete formwork and false work in accordance with CSA standard A23.1-94 (or latest edition), Concrete Materials and Methods of Concrete Construction, except where stricter standards specify otherwise. |
| | .2 | CSA S269.1-1975 (or latest edition), Falsework for Construction Purposes. |
| | .3 | CAN/CSA-S269.3 (latest edition), Concrete Formwork. |
| <u>1.3 Submissions</u> | .1 | Shop Drawings:
.1 Upon request, submit to the Departmental Representative for review four (4) sets of formwork and falsework shop drawings, in accordance with Section 01 33 00, at least four (4) weeks prior to erection. All such drawings to be stamped and signed by a professional engineer registered in the Province of Prince Edward Island.
.2 Clearly indicate method and schedule of construction, materials, arrangement of joints, ties, shores, liners, and locations of temporary embedded parts. Comply with CSA S269.1 for falsework drawings. |
| | .2 | Product Data/Samples:
.1 Provide product data and samples for form ties. |

- .3 Provide submissions in accordance with Section 01 33 00.

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| <u>1.4 Measurement for Payment</u> | .1 This item will not be measured separately. |
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PART 2 - PRODUCTS

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| <u>2.1 Materials</u> | .1 Formwork lumber: plywood and wood formwork materials to CSA A23.1. |
| | .2 False work materials: to CSA S269.1. |
| | .3 Form stripping agent: colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Saybolt Universal, 15 to 14 mm ² /s at 40DC, flash-point minimum 150DC, open cup. |
| | .4 Form ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia in concrete surface. When forms are removed, no metal will be less than 75 mm from the surface of the concrete. |

PART 3 - EXECUTION

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| <u>3.1 Erection</u> | .1 Verify lines and levels before proceeding with formwork and ensure dimensions agree with drawings. |
| | .2 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1. |

- .3 Line forms with material only as approved by the Departmental Representative.
- .4 Construct falsework in accordance with CSA S269.1.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Use 25 mm chamfer strips on external corners of precast deck panels except where panels connect laterally and longitudinally. Place 25mm chamfer strips on all external corners of cast-in place concrete pile caps.
- .7 Clean formwork in accordance with CSA A23.1, before placing concrete.
- .8 Leave formwork in place for at least seven (7) days.
- .9 Re-use of formwork and falsework subject to requirements of CSA A23.1.
- .10 All holes from form ties and rods to be plugged with mortar to requirements of CSA A23.1. When forms are removed, no metal will be less than 70 mm from the surface of the concrete.
- .11 Build in anchors, sleeves, other inserts required to accommodate work specified in other sections.

PART 1 - GENERAL

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| <u>1.1 Related Work</u> | .1 | Refer to other Specification Sections for related information. |
| | .2 | Refer to Section 01 33 00 for Shop Drawing/Submission requirements. |
| <u>1.2 Reference Standards</u> | .1 | Perform concrete reinforcement work in accordance with CSA standard A23.1-94 (or latest edition), Concrete Materials and Methods of Concrete Construction, except where stricter standards specify otherwise. |
| | .2 | Reinforcing Steel Manual of Standard Practice (Second Edition - 1995) (or latest edition) by Reinforcing Steel Institute of Ontario. |
| | .3 | CSA G30.18 (or latest edition), Billet-Steel Bars for Concrete Reinforcement. |
| | .4 | CSA G30.3-M1983 (R1991) (or latest edition), Cold-Drawn Steel Wire for Concrete Reinforcement. |
| <u>1.3 Source Sampling</u> | .1 | Upon request, provide the Departmental Representative with certified copy of mill test of steel supplied showing physical and chemical analysis not less than 3 weeks prior to commencement of work. |
| <u>1.4 Submissions</u> | .1 | Shop Drawings: |
| | .1 | Clearly indicate bar sizes, spacing, location and quantities of reinforcement, mesh, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural |

drawings; to Reinforcing Steel Manual of Standard Practice.

.2 Detail placement of reinforcing where special conditions occur.

.3 Design and detail lap lengths and bar development lengths to CSA standard A23.1, unless otherwise specified on drawings. Provide Class B tension lap splices unless otherwise indicated.

.2 Product Data/Samples:

.1 Provide product data for supports and spacers.

.3 Test Results:

.1 Provide Mill Test Certificates cross referenced to the product supplied to the site.

.4 Provide submissions in accordance with Section 01 33 00.

1.5 Storage

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

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

1.6 Measurement of Payment

.1 This item will not be measured separately.

.2 Supply and placing of reinforcement, wire ties and spacers to be considered incidental to the work.

PART 2 - PRODUCTS

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| <u>2.1 Materials</u> | .1 | Reinforcing steel: to CSA G30.18; billet steel grade 400W deformed bars. |
| | .2 | Wire ties: to CSA G30.3 plain, cold drawn annealed steel wire. |
| | .3 | Spacers: PVC, Fabricated to suit site dimensions. |
| <u>2.2 Reinforcing Steel Fabrication</u> | .1 | Fabricated reinforcing to CSA standard A23.1. |
| | .2 | Fabrication tolerances for reinforcing steel to Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. |
| | .3 | Obtain the Departmental Representative's acceptance for location of reinforcement splices other than shown on steel placing drawings. |
| | .4 | Ship bundles of bar reinforcement clearly identified in accordance with bar list. |
| | .5 | Do not weld reinforcing steel. |

PART 3 - EXECUTION

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| <u>3.1 Placing</u> | .1 | Accurately place reinforcing in positions indicated and hold firmly during placing, compacting and setting of concrete. |
| | .2 | Tie reinforcement where spacing in each direction is:
.1 Less than 300 mm: - tie at alternate |

intersections.

.2 300 mm or more: - tie at each intersection.

.3 Ensure cover to reinforcement is maintained during concrete pour.

3.2 Field Bending

.1 Do not field bend reinforcement except where indicated or authorized by the Departmental Representative.

.2 When authorized, bend reinforcement without heat, by applying slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.3 Cleaning

.1 Clean reinforcing before placing concrete.

3.4 Inspection

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

3.5 Surface Conditions

.1 Reinforcement, at time concrete is placed, to be free from mud, oil or other nonmetallic coatings that adversely affect bonding capacity.

.2 Reinforcement, with rust, mill scale, or combination of both to be considered as satisfactory, provided minimum dimensions, including height of deformations, and mass of hand wire brushed test specimen are not less than specified requirements in applicable CSA Standards.

PART 1 - GENERAL

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| <u>1.1 Related Work</u> | .1 | Refer to other Specification Sections for related information on aggregates, form work and false work, concrete reinforcement, paint, miscellaneous items. |
| | .2 | Refer to Section 01 33 00 for Shop Drawing/Submission requirements. |
| <u>1.2 Reference Standards</u> | .1 | Do structural concrete work in accordance with CSA A23.1-94 (or latest edition), Concrete Materials and Methods of Concrete Construction, except where stricter standards specify otherwise. |
| | .2 | CAN/CSA-A5/A8/A362-93 (or latest edition), Portland Cement/ Masonry Cement / Blended Hydraulic Cement. |
| | .3 | CSA A23.5-M86 (R1992) or latest edition), Supplementary Cementing Materials. |
| | .4 | ASTM C494-92 (or latest edition), Chemical Admixtures for Concrete. |
| <u>1.3 Submissions</u> | .1 | Shop Drawings:
.1 Upon request, 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 Upon request, submit placement drawings for miscellaneous items. |
| | .2 | Product Data/Samples:
.1 Provide technical data and/or samples |

for curing compounds, evaporation retardant and finishing aids, expansion joint materials/sealants, grouts.

.3 Certificates:

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

.1 Portland cement.

.2 Admixtures.

.3 Aggregates

.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 and yield and that strength will comply with CSA A23.1.

.4 Provide certification that concrete will not include alkali reactivity aggregates.

.4 Methodology:

.1 Submit methodology for cold weather concreting.

.2 Submit methodology for hot weather concreting.

.3 Submit methodology for concrete placement operations.

.4 Submit methodology for concrete deck finishing operations.

.5 Submit methodology for supporting reinforcing steel.

.5 Test Results:

.1 Provide design mix tests results.

.2 Provide mill test certificates for reinforcing steel.

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| 1.4 <u>Storage of Materials</u> | .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 an 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 <u>Source Sampling</u> | .1 | At least 4 weeks prior to commencing work, inform departmental representative of proposed source of aggregates and provide access for sampling. |
| 1.6 <u>Ready-Mix Concrete Supply</u> | .1 | Provide, with each load of concrete delivered to pre-cast panel fabrication site, duplicate delivery slips containing following: <ul style="list-style-type: none"> .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 and loading or first mixing of aggregate, cement and water. .8 Time of discharge of concrete. .9 Admixtures added to plant. .10 Amount of water added to plant. |
| 1.7 <u>Measurement of Payment</u> | .1 | Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work. |

- .2 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.
- .3 Supply of anchor bolts, washers, lifting inserts and nuts will not be measured but considered incidental to work. Bolt grouting will be considered incidental to the work.
- .4 Supply of installation of cast in sleeves, expansion joint, sealants, sealers and curing compounds, or other compounds will be considered incidental to the work.
- .5 Concrete work will be measured in accordance with Section 01 10 10.
- .6 No deduction will be made for volume of concrete displaced by reinforcing steel or structural steel.
- .7 All joint sealant shall be considered incidental to the work.
- .8 Lump sum price for pre-cast units shall include all materials, labour and equipment to fabricate, handle, transport, lift and install pre-cast units.

PART 2 - PRODUCTS

2.1 Materials

- .1 Aggregates: to CSA A23.1, for Class "C-1" exposure.
- .2 Portland Cement: to CSA A5, normal type 10.
- .3 Water: to CSA A23.1.
- .4 Admixtures:
 - .1 Air entraining admixtures: to CSA A23.5 and ASTM A26.
 - .2 Chemical admixtures: to CSA A23.5 and

ASTM C494.

.3 Pozzolanic mineral admixtures: to CSA A23.5.

- .5 Non-shrink grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 50 MPa at 28 days.
- .6 Curing compound: to ASTM-C309-M81 and CSA A23.1-M94 (or latest edition) type 1D with fugitive dye.
- .7 Joint sealer: self leveling, two component sealant capable of remaining resilient over temperatures ranging from - 25° C to 35° C. Material will be capable of an elongation of 300%, have tensile recovery of 90% ASTM D412-75 (or latest edition), hardness of 25-35 Shore A and have a high bond strength to the concrete faces.
- .8 Silane Sealer: self-penetrating, 100% silane, clear, breathable. Hydrozo 100 or equal.

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 11 in CSA A23.1-94 (or latest edition). Comply with additional requirements of CSA A23.1-94 (or latest edition), Section 15 for concrete placed near sea water.
 - .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.

- .5 Maximum aggregate size: 20mm
- .6 Air content: 6 to 8%.
- .7 Slump at time and point of discharge 20 to 80 mm. Where the nature of the work required larger slumps, they are to be obtained by the use of admixtures rather than increasing the water content. The use of such admixtures and the increase in slump to be approved by the departmental representative prior to implementation in the work.
- .8 Modify concrete mix to the approval of the departmental representative to accommodate pumping.
- .9 Admixtures to the approval of the departmental representative and the recommendation of the manufacturer. Admixtures must be dispersed separately into mixing water.
- .2 Do not use calcium chloride or compounds containing calcium chloride.
- .3 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 Engineer upon request.
- .4 **Where seven day strength is less than 70% of specified 28 day strength, provide additional protection curing** and make changes to mix proportions to the satisfactions of the departmental representative.
- .5 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1-94 (or latest edition).
- .6 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.

PART 3 - EXECUTION

3.1 General

- .1 Place, consolidate, finish, cure and protect concrete to CSA A23.1-94 (or latest edition) except where specified otherwise.
- .2 Prior to placing of concrete, obtain departmental representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .3 Comply with additional requirements of CSA A23.1-94 (or latest edition) Section 15 except where specified otherwise, for concrete exposed to seawater environment.
- .4 Do not commence placing concrete until a Departmental Representative has inspected/reviewed forms, inserts, dowels, reinforcing steel, joints, conveying, spreading, consolidation, finishing, curing and protective methods.
- .5 Ensure that reinforcement and anchorage are not disturbed during placing.
- .6 Maintain accurate records of placed concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .7 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 Prince Edward

Island.

- .8 **Comply with additional requirements of CSA A23.1-94 (or latest edition), Clause 15,** for concrete exposed to seawater environments during placement and curing.
- .9 Concrete Sealers: use penetrating silane sealers on all concrete surfaces. Acceptable product Hydrozo 100 or equal.
- .10 Provide uniform broom finish on top surface of pre-cast deck panels.
- .11 Ensure pre-cast units fit together tightly and are level and plumb.
- .12 Repair all cracks greater than 0.2mm in width with an epoxy injection grout. Repair methods and materials to be submitted to a Departmental Representative for approval.

3.2 Reinforcing Steel

- .1 Place new reinforcing steel according to Section 03 20 00.
- .2 Provide 70 mm minimum cover for all reinforcing steel unless indicated otherwise on drawings.

3.3 Formwork

- .1 Verify field dimensions to determine applicable sizes of formwork.
- .2 Design and construct form work to allow adequately for proper placement and consolidation while conforming with shape and dimensions shown on plans.
- .3 Formwork design will include closures at both top and bottom of form, and all necessary hardware to support the forms.

- .4 Upon request, submit drawings for review by the departmental representative, at least 3 weeks before placement of concrete. Drawings, will show formwork details and illustrate dimensions, method of placing of concrete, connections and support.
- .5 As a rule, 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 A23.1-94 (or latest edition).
- .2 If allowed by the 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.
- .3 Concrete will be deposited in all cases as neatly as practicable, directly in its final position, and will not be caused to flow in a manner to permit or cause segregation.
- .4 Each layer of concrete will be vibrated and

tamped with an appropriate vibrator as allowed by the departmental representative. The concrete must be compacted to the maximum practicable density, free of air pockets, and until it is in complete contact with the reinforcement and formwork.

- .5 Surface of finished concrete to be within 15 mm of elevation indicated and variation in elevation indicated and variation in elevation over whole area not to exceed 25 mm.

3.5 Inserts

- .1 Set galvanized sleeves and other inserts and openings as indicated or specified elsewhere. Sleeves and opening greater than 100 x 100 mm not indicated on drawings must be approved by departmental representative.
- .2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from the departmental representative before placing of concrete.
- .3 Galvanized items embedded in concrete will be completely separated from reinforcing steel.
- .4 Anchor bolts:
 - .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
 - .2 With departmental representative's concurrence, epoxy anchored anchor bolts are to be set in holes at least 3mm larger in diameter than the diameter of the bolt.

3.6 Protection and Curing

- .1 Provide protection and curing in accordance with CSA A23.1.
- .2 Protect concrete with windproof shelter to allow free circulation of inside air around fresh concrete. Do not let walls of shelter

touch formwork and provide sufficient space for removal of formwork.

- .3 Supply approved heating equipment to maintain inside air at following temperatures:
 - .1 For an initial three days, at not less than 10° C nor more than 25° C at surfaces.
 - .2 At not less than 10° C for an additional 4 consecutive days or for the time necessary to attain 70% of the specified 28-day compressive strength of the concrete.
 - .3 Reduce temperature near end of curing period at rate not exceeding 20° C per day.
 - .4 Do not overheat.
- .4 Provide a fully "wet cure" for the concrete deck slab through the use of wet burlap or soaker hoses. Keep concrete surfaces continuously moist during protection stage and allow concrete to dry before removal of protection.
- .5 Freshly deposited concrete will be protected from premature drying and excessively hot and cold temperatures, will be maintained without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete. It will be protected from harmful effects of sunshine, drying winds, cold weather, running or surface water and mechanical shock.
- .6 Wood floating, broom finishing, placing of burlap and inspection of concrete to be done from transverse bridges of rigid construction free from wobbles and springing under use, unless other methods have been submitted and accepted.

3.7 Finishing

- .1 Finish concrete in accordance with CSA A23.1-94 (or latest edition).

- .2 Grind off fins, nibs and other raised protuberances with an approved hand stone.
- .3 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise detailed.

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 A23.1-94 (or latest edition).
- .2 The departmental representative will pay for costs of tests as specified in Section 01 45 00.
- .3 The 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 A23.1-94 and CSA A23.2-94 (or latest editions).
- .5 Arrange and pay for inspection and testing when necessary for production control to meet requirements.
- .6 Inspection and testing by the 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 Failing to meet any requirement of this specification.

.2 Concrete contains honeycombing or embedded debris.

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

.2 Repair or remove and replace defective work as directed by the departmental representative.

.3 Take corrective measures as directed by the departmental representative to prevent occurrence of further defective concrete.

.4 Seal all cracks in concrete deck with epoxy injection repair. It is intended that cracks as small as 0.2 mm will be repaired.

PART 1 - GENERAL

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|------------------------------------|----|--|
| <u>1.1 RELATED WORK</u> | .1 | Rough Carpentry: Section 06 10 00 |
| <u>1.2 DESCRIPTION OF WORK</u> | .1 | The work of this Section comprises the furnishing of all labour, materials and equipment necessary for the supply and installation of items of work specifically listed under Part 2 - PRODUCTS of this Section, as specified in this Section and shown on the Drawings. |
| <u>1.3 MEASUREMENT FOR PAYMENT</u> | .1 | Measurement of Payment for mooring cleats will be in units of each, and shall include all labour, materials, and equipment to supply and install the mooring cleat. |
| | .2 | Measurement of Payment for ladders shall be in units of each and shall include all labour, materials and equipment to supply and install the ladders as by the project documents described. |
| | .3 | Measurement of Payment of all other items (metal connectors and fasteners) indicated shall be considered incidental to the work. |

PART 2 - PRODUCTS

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| <u>2.1 MOORING CLEATS</u> | .1 | Cast steel mooring cleat, located as indicated on the drawings and sized to the owners requirements. |
| <u>2.2 MISCELLANEOUS METAL</u> | .1 | Steel sections and plates: to CAN/CSA G40.21, Grade 350W except where specified otherwise. |
| | .2 | Ladder rungs: to CSA C-40.21 round bars to size as indicated. |
| | .3 | Welding materials: to CSA W59. |

.4 Bolts and anchor bolts: to ASTM A307.

2.3 GALVANIZING

.1 Hot dip galvanize bolts, nuts and washers and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails to CAN/CSA-G164. All steel materials shall be hot dipped galvanized (min. 700gr/m3) suitable for marine environment.

PART 3 - EXECUTION

3.1 CLEATS / Ladders

.1 Install at locations indicated on drawings.

3.2 MISCELLANEOUS METALS

.1 Do miscellaneous steel work in accordance with CAN/CSA S16.1.

.2 Welding in accordance with CSA W59. Install miscellaneous site items as indicated on drawings.

3.3 FABRICATION GENERAL

.1 Fabricate steel, as indicated, in accordance with CAN/CSA-S16.1 and in accordance with reviewed shop drawings.

.2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.3 Use welded connections for both interior and exterior metal work unless otherwise indicated or approved by Departmental Representative.

.4 Where possible, fit and shop assemble work, ready for erection.

.5 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.6 Grind and polish all exposed edges and corners to leave smooth surface free

from burrs or other sharp protrusions.

.7 All holes shall be punched or drilled.
Burning holes in any steel member is
NOT permitted.

.8 Galvanize all steel materials.

3.4 CONNECTION TO EXISTING WORK

.1 Verify dimensions, alignment,
elevations and condition of existing
work before commencing fabrication and
report any discrepancies and potential
problem areas to a Departmental
Representative and await instructions.

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 06 10 00- Rough Carpentry.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

1.2 References

- .1 Canadian Standards Association (CSA)
 - .1 CSA O80 Series-[08], Wood Preservation.
 - .2 CSA O80.201-[M89], Standard for Hydrocarbon Solvents for Preservatives. This Standard covers hydrocarbon solvents for preparing solutions of preservatives.- This is not stand alone specification
 - .5 CSA O322-02(R2007), Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

1.3 Quality Assurance

- .1 Plant inspection of products treated with preservative by pressure impregnation will be carried out by designated testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.
- .2 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA O322 certified stamp.

- .3 Inspection and testing of materials will be carried out by a Testing Laboratory designated by a *Departmental Representative*.
- .4 A *Departmental Representative* will pay for costs of tests.

1.4 Regulatory Requirements

Not Applicable

1.5 Certificates

- .1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
- .2 For products treated with preservative by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
 - .1 Information listed in AWP A M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWP A M2 applicable to specified treatment.
 - .2 Moisture content after drying following treatment with water-borne preservative.

1.6 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Do not dispose of preservative treated wood through incineration.
- .3 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
- .4 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill

approved by a *Departmental Representative*.

- .5 Dispose of unused wood preservative material at official hazardous material collections site approved by a *Departmental Representative*.
- .6 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard.

PART 2 - PRODUCTS

2.1 Materials

- .1 Preservative: to CSA-080 Series, finish to be determine by a *Departmental Representative*

PART 3 - EXECUTION

3.1 Application: Preservative

- .1 Treat timber to CSA 080.18-M89 Pressure Treated Piles and Timbers in Marine Construction.

3.2 Application: Fire-Retardant

Not Applicabale

3.3 Application: Field Treatment

- .1 Comply with AWWA M4 and revisions specified in CSA 080 Series, Supplementary Requirements

to AWPA M2.

- .2 Remove chemical deposits on treated wood to receive applied finish.

PART 1 - GENERAL

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| <u>1.1 Related Sections</u> | .1 | Section 01 61 00 - Common Product Requirements. |
| <u>1.2 References</u> | .1 | Canadian Standards Association (CSA International)
.1 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
.2 CAN/CSA-O141-[91(R2004)], Softwood Lumber.
.3 CAN/CSA-080 Series-08, Wood Preservative. |
| | .2 | National Lumber Grades Authority (NLGA)
.1 Standard Grading Rules for Canadian Lumber [2000]. |
| <u>1.3 Quality Assurance</u> | .1 | Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board. |
| <u>1.4 Waste Management and Disposal</u> | .1 | Do not dispose of preservative treated wood through incineration. |
| | .2 | Do not dispose of preservative treated wood with materials destined for recycling or reuse. |
| | .3 | Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by a <i>Departmental Representative</i> . |
| | .4 | Dispose of unused wood preservative material at official hazardous material collections site approved by a <i>Departmental Representative</i> . |
| | .5 | Do not dispose of unused preservative |

material into sewer system, into streams, lakes, onto ground or in other locations where they will pose health or environmental hazard.

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| 1.5 Measurement
for <u>Payment</u> | .1 | Supply and installation of all pressure treated timber shall be measured in accordance with section 01 10 10. The supply and installation connecting bolts, lag screws, nuts, washers or other attachments shall be considered incidental to the work. |
|---------------------------------------|----|--|

PART 2 - PRODUCTS

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| <u>2.1 Materials</u> | .1 | Timbers to CSA-0141-05. |
| | .1 | Species: D-fir grade No. 1. |
| | .2 | Type: pressure treated. |
| | .3 | Sound seasoned wood with ends square. |
| | .4 | Dimensions as indicated. |
| | .5 | Straight, free from loose knots, sweep, stakes, rot and checks. |
| | .2 | Treatment of materials: |
| | .1 | All timber shall be treated with CCA (chromate copper arsenate) preservatives in accordance with CSA 080 Series 97, water borne salt preservative (6.4 kg/m ²). Use of creosote Oil not permitted. |
| | .3 | Miscellaneous Steel: |
| | .1 | Bolts, nuts and washers to ASTM A307. Galvanized finish. |
| | .3 | Nails and Spikes: |
| | | In accordance with CSA Standard B111. Galvanize finish. |
| <u>2.2 Finishes</u> | .1 | Galvanizing: to CAN/CSA-G164, use galvanized fasteners. |

PART 3 - EXECUTION

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|-------------------------|----|--|
| <u>3.1 Preparation</u> | .1 | Treat surfaces of material with wood preservative, before installation. |
| | .2 | Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood. |
| | .3 | Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation. |
| <u>3.2 Installation</u> | .1 | Install timbers as indicated. |
| <u>3.3 Erection</u> | .1 | Countersink bolts to provide flush finish where indicated. |
| | .2 | Fill countersunk holes with non- shrink grout, suitable for exterior work including freeze - thaw conditions. |

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 [01 50 00 - Temporary Facilities.
- .4 Section 01 35 44 - Environmental Procedures.
- .5 Section 31 32 19.01 - Geotextiles.
- .6 Section 02 41 13 - Selective Site Demolition.

1.2 Measurement Procedures

- .1 Excavated materials will be measured in tonnes in their original location.
 - .1 Common excavation quantities measured will be actual volume removed within following limits:
 - .1 Width for trench excavation as indicated.
 - .2 Width for excavation for structures as indicated.
 - .3 Depth from ground elevation immediately prior to excavation, to elevation as indicated or as directed by a *Departmental Representative*.
- .2 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
- .3 Backfilling to authorized excavation limits will be measured in tonnes compacted in place for each type of material specified.

- .4 Placing and spreading of gravel will be measured for payment in tonnes calculated from cross sections taken in area of excavation from original location. If double handling of gravel is directed by a *Departmental Representative* through stockpiling and later placing, then quantities will be measured twice; on excavation from original location and on excavation from stockpile.

1.3 References

- .1 American Society for Testing and Materials (ASTM)
- .1 ASTM C 117-[95], Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-[96a], Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 422-[98], Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D 698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D 1557-[00], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D 4318-[00], Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.1-[88], Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-[M88], Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)
- .1 CAN/CSA-A3000-[98]-A5-[98], Portland Cement.

.2 CAN/CSA-A23.1-[00], Concrete Materials
and Methods of Concrete Construction.

1.4 Definitions

- .1 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4 Unsuitable materials:
 - .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to STM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.2 Table 1

Sieve Designation	% Passing
2.00 mm	[100]
0.10 mm	[45 - 100]
0.02 mm	[10 - 80]
0.005 mm	[0 - 45]

- .3 Coarse grained soils containing more than [20] % by mass passing 0.075 mm sieve.

1.5 Submittals

- .1 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform a *Departmental Representative* at least 4 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.
 - .3 Upon Request, submit 70 kg samples of type of fill specified including representative samples of excavated material.
 - .4 Upon request, ship samples prepaid to a *Departmental Representative* in tightly closed containers to prevent contamination.

1.6 Quality Assurance

- .1 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Prince Edward Island, Canada.
- .2 Keep design and supporting data on site.
- .3 Engage services of qualified professional Engineer who is registered or licensed in Province of Prince Edward Island, Canada in which work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning if required for Work.

1.7 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Collect and separate 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.

1.8 Protection of Existing Features

- .1 Protect existing features in accordance with Section 01 50 00 - Temporary Facilities and applicable local regulations.
- .2 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 Prior to commencing excavation Work, notify applicable Owner or authorities having jurisdiction; establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .3 Confirm locations of buried utilities by careful test excavations.
 - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered [as indicated].
 - .5 Where utility lines or structures exist in area of excavation, obtain direction of a *Departmental Representative* before re-routing.
 - .6 Record location of maintained, re-routed and abandoned underground lines.
 - .7 Confirm locations of recent excavations adjacent to area of excavation.
- .3 Existing buildings and surface features:
 - .1 Conduct, with a *Departmental Representative*, condition survey of existing buildings, trees and other plants, lawns,

fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to approval of a *Departmental Representative*.

PART 2 - PRODUCTS

.1 Material: See Section 31 37 00 for material specifications.

.2 Geotextiles: See Section 31 32 19.01 for geotextile specifications.

PART 3 - EXECUTION

3.1 Site Preparation

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

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 Stripping of Topsoil

Not Applicable

3.3 Stockpiling

.1 Stockpile fill materials in areas designated by a *Departmental Representative*. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.4 Cofferdams, Shoring, Bracing and Underpinning Not Applicable

3.5 Dewatering and Heave Prevention Not Applicable

3.6 Excavation

- .1 Advise a *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 directed by a *Departmental Representative*.
- .3 Remove concrete and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Dispose of surplus and unsuitable excavated material in approved location off site.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

3.7 Fill Types and Compaction .1 All fill materials will be in accordance with Section 31 37 00 - Rip Rap. Compaction densities are percentages of maximum

densities obtained from ASTM D 698.

3.8 Bedding and
Surround of
Underground
Services

Not applicable

3.9 Backfilling

- .1 Do not proceed with backfilling operations until a *Departmental Representative* has inspected and approved installations.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 48 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 0.25 m.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from a *Departmental Representative*.
- .6 Install geotextiles in backfill in accordance

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with section 31 32 19.01 - Geotextiles.as
directed by a *Departmental Representative*.

3.10 Restoration

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 19 - Construction/Demolition Waste Management And Disposal, trim slopes, and correct defects as directed by a Departmental Representative.
- .2 Replace gravel as indicated by a *Departmental Representative*.
- .3 Clean and reinstate areas affected by Work as directed by a *Departmental Representative*.

PART 1 - GENERAL

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|-----------------------------------|----|--|
| <u>1.1 Section Includes</u> | .1 | Materials and installation of polymeric geotextiles purpose of which is to:
.1 Separate and prevent mixing of granular materials of different grading. |
| <u>1.2 Related Sections</u> | .1 | Section 01 33 00 - Submittal Procedures. |
| <u>1.3 Measurement Procedures</u> | .1 | Measure geotextiles in square meters of surface covered by material. No allowance will be made for seams and overlaps. |
| <u>1.4 References</u> | .1 | American Society for Testing and Materials International, (ASTM)
.1 ASTM D4632. Grab Tensile strength test.
.2 ASTM D 4751, 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)], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
.2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
.1 No.7.3-[92], Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles. |

- | | | |
|---|----|---|
| <u>1.5 Submittals</u> | .1 | Submit samples in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Submit to a <i>Departmental Representative</i> following samples at least 4 weeks prior to beginning Work. <ul style="list-style-type: none">.1 Minimum length of 2 m of roll width of geotextile..2 Minimum of 1 m seam with at least 300 mm of geotextile on both sides of seam. |
| <u>1.6 Delivery, Storage and Handling</u> | .1 | During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents. |
| <u>1.7 Waste Management and Disposal</u> | .1 | Remove from site and dispose of all packaging materials at appropriate recycling facilities. |
| | .2 | Collect and separate for disposal paper, plastic polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling. |
| | .3 | Fold up metal banding, flatten and place in designated area for recycling. |

PART 2 - PRODUCTS

- | | | |
|---------------------|----|---|
| <u>2.1 Material</u> | .1 | Geotextile: Non-Woven synthetic fiber fabric, supplied in rolls. <ul style="list-style-type: none">.1 Width: 3.5 m minimum..2 Length: 150 m minimum. |
|---------------------|----|---|

- .2 Physical properties:
 - .1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 237 g/m².
- .3 Hydraulic properties:
 - .1 Apparent opening size (AOS): to ASTM D 475], 0.3 mm.
 - .1 Permittivity: to ASTM D 4491, 2.2 pers.
- .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.

PART 3 - EXECUTION

3.1 Installation

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with pins or weights.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on 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 600 mm interval at mid-point of lap.
- .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 h of placement.

- .8 Replace damaged or deteriorated geotextile to approval of a *Departmental Representative*.
- .9 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.

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.

PART 1 - GENERAL

- | | | |
|------------------------------------|----|---|
| <u>1.1 Related Work</u> | .1 | Refer to other Specification Sections for related information. |
| | .2 | Refer to Section 01 33 00 for submittal requirements. |
| <u>1.2 Reference Standards</u> | .1 | ASTM C127-88(2001) el (or latest edition) Specific Gravity and Absorption or Coarse Aggregate. |
| | .2 | AASHTO T85-88 (or latest edition) Specific Gravity and Absorption of Coarse Aggregate. |
| <u>1.3 Submissions</u> | .1 | Product Data/Samples:
.1 Provide samples of materials proposed for the work. |
| | .2 | Methodology:
.1 Provide methodologies for carrying out the work. |
| | .3 | Provide submissions in accordance with Section 01 33 00. |
| <u>1.4 Measurement for Payment</u> | .1 | All materials will be measured in accordance with Section 01 10 10. |
| | .2 | Prices will include the entire cost of supplying and placing the material in the work, rough grading as necessary, the leveling and finish grading of the listed materials and taking as shown on the drawings, and as specified. |

PART 2 - PRODUCTS

2.1 Materials

- .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 Core stone rock fill shall consist of clean hard, durable quarried stone having a specific gravity of not less than 2.65 (ASTM C127). The rock material, if subjected to the Los Angeles Abrasion Test (ASTM C131), shall have a loss not greater than 35%. When tested for soundness, five cycles of magnesium sulphate (ASTM C88), the rock material shall have a loss not greater than 15%. Sandstone rock will not be acceptable for use as core stone rock fill.
- .4 Armour Stone: Dimension of each rock shall not exceed two times the least dimension. Armour stone shall consist of 0.5-1.5 tonne stones placed in one of two layers as depicted on the drawings. Minimum specific gravity of 2.65 when tested to ASTM C127.
- .5 Filter stone: Dimension of each rock shall not exceed two times the least dimension. Filter stone shall consist of 50-150 kg stones placed in one of two layers as depicted on the drawings. Minimum specific gravity of 2.65 when tested to ASTM C127.
- .6 Structural fill (Premium borrow) shall consist of an approved soil (preferable granular) which is free of organics and deleterious materials such as a pit run sandstone or other approved inorganic soil. Fill material meeting the current Prince Edward Island

Transportation and Infrastructure Renewal (PEITIR) Premium Borrow specification. Premium borrow shall be non-plastic well graded and composed of clean, uncoated particles free from lumps or other deleterious materials with a maximum particle size of 100 mm and a maximum of 20% of the material passing the 4.75 mm sieve shall pass the 75 μ m sieve. Structural fills to be placed and compacted to 100% Standard Proctor maximum dry density. Max lift thickness should not exceed 300 mm and must be compatible with the compaction equipment used.

.7 Class "A" Gravel

.1 Gravels shall be sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material or other deleterious substances. The material shall be approved by a Departmental Representative prior to utilization.

.2 The gravel shall meet the gradation requirements detailed in Table 2. Gradation to be within the following limits when tested to ASTM C136 and giving a smooth curve without sharp breaks when plotted on a semi-log grading chart.

.3 Los Angeles Abrasion to ASTM C131 maximum percent loss by mass: 35.

.4 The crushed material shall be a minimum of 75 % by mass retained on a 4.75 mm sieve having 2 or more mechanically fractured faces.

.5 Petrographic number (max): 150.

Table 2-Class "A" Gravel

ASTM Sieve Designation	% Passing by Mass
31.5 mm	100
25.0 mm	95-100
12.5 mm	50-83
4.75 mm	30-60
1.18 mm	15-40
600 µm	10-32
300 µm	5-22
75 µm	3-9

PART 3 - EXECUTION

3.1 Preparation

- .1 Dredge and remove existing material in accordance with Section 35 20 23 in the area where rock fill sub-base is to be placed.
- .2 Sound area and record elevation of material on which base will be placed before placing rock fill and/or rip rap.

3.2 Placement

- .1 Do not place rock fill until bottom area has been accepted by a *Departmental Representative*.
- .2 Place sub-base material to avoid segregation of material sizes.
- .3 Level top surface of sub-base to specified grade.

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 75mm.
- .2 Other layers to be within 100 mm 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 materials lost due to storms, tidal erosion or by his own activities.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures

1.2 REFERENCES

- .1 Stantec Geotechnical Report: The entire report can be accessed through a Departmental Representative.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Sub-surface investigation reports: when site conditions differ from those indicated, submit written notification to a *Departmental Representative* and await further instructions.
- .3 Submit schedule of planned sequence of driving to a *Departmental Representative* for review, as specified.
- .4 Equipment:
 - .1 Submit prior to pile installation for review by a *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 Submit drivability analyses as specified, to a *Departmental Representative* for approval of hammers.
- .6 Quality assurance submittals:
 - .1 Test reports: submit 3 copies of certified test reports for piles from approved independent testing laboratories,

indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's instructions.
- .2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.
- .3 Replace damaged piles as directed by a *Departmental Representative*.

1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for disposal in accordance with Section 01 74 21.

1.6 EXISTING
CONDITIONS

- .1 Sub-surface investigation report is available upon request.
- .2 Notify a *Departmental Representative* in writing if subsurface conditions at site differ from those indicated and await further instructions from a *Departmental Representative*.

1.7 SCHEDULING

- .1 Provide schedule of planned sequence of driving to a *Departmental Representative* for review, not less than two weeks prior to commencement of pile driving.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Material requirements for piles are specified in Section 31 62 19.
- .2 Supply or fabricate full length piles as indicated and provide equipment to handle full length piles without cutting and splicing.
- .3 Splice piles only with written approval of a *Departmental Representative*.
 - .1 When permitted, provide details for a *Departmental Representative's* review.
 - .2 Design details of splice to bear dated signature stamp of Professional Engineer registered or licensed in Province of Prince Edward Island, Canada.

2.2 EQUIPMENT

- .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 auguring, jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.
- .3 Hammer:
 - .1 Hammers to be selected on basis of drivability analysis using wave equation theory, performed to show that piles can be driven to levels indicated.
 - .2 Drivability analysis to include, but not be limited to, following: hammer, cushion, and cap block details; static soil parameters; quake and damping

factors, total soil resistance, blow count, pile stresses and energy throughput at representative penetrations.

.3 When required criteria cannot be achieved with the proposed hammer, use larger hammer and take other measures as required.

.4 Hammer shall be capable of delivering an energy of 750J/cm of timber pile tip diameter.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Protection:
 - .1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.
 - .2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.
 - .3 When damages occur, remedy damaged items to restore to original or better condition at own expense.
- .2 Ensure that conditions at pile locations are adequate to support pile driving operation and load testing operation. Make provision for access and support of piling equipment during performance of Work.

3.2 INSTALLATION

- .1 Leads: construct pile driver leads to provide free movement of hammer.
 - .1 Hold leads in position at top and bottom, with guides, stiff braces, or other means reviewed by a *Departmental Representative*, to ensure support to pile while being driven.
 - .2 Lengths: provide sufficient length of leads to ensure that use of follower is unnecessary.
 - .3 Swing leads:
 - .1 Not permitted.

- .2 Followers:
 - .1 Provide followers of such size, shape, length and mass to permit driving pile in desired location to required depth and resistance.
 - .2 Provide followers with socket or hood carefully fitted to top of pile to minimize loss of energy and prevent damage to pile.
- .3 Installation of each pile will be subject to review of a *Departmental Representative*.
 - .1 A Departmental Representative will be the 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 A Departmental Representative to review final driving of all piles prior to removal of pile driving rig from site.
- .4 Drive shoes or reinforced pile tips shall be used to protect all timber piles during driving.
- .5 Drive each pile to practical refusal in bedrock and to elevation indicated on the project drawings.
 - .1 Do not overdrive to cause damage to piles in bedrock.
 - .2 Refusals defined as 4 blows for the last 25 mm with a hammer delivering an energy of 750 J/cm of timber pile tip diameter.
- .6 Drive each pile to pile tip elevation as indicated.
- .7 Secure piles in position with falsework as required to facilitate rock fill installation.

3.3 APPLICATION / DRIVING

- .1 Use driving caps and cushions to protect piles.

- .1 Reinforce pile heads as required by a Departmental Representative.
- .2 Piles with damaged heads as determined by a Departmental Representative will be rejected.
- .2 Hold piles securely and accurately in position while driving.
- .3 Deliver hammer blows along axis of pile.
- .4 Ensure no contact between pile and existing structure takes place.
- .5 Re-strike already driven piles lifted during driving of adjacent piles to confirm set.
- .6 Cut off piles neatly and squarely at elevations as indicated to tolerance of plus or minus 5 mm.
 - .1 Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.
- .7 Remove cut-off lengths from site on completion of work.

3.4 OBSTRUCTIONS

- .1 Where an obstruction is encountered that causes sudden unexpected change in penetration resistance or deviation from specified tolerances, notify a Departmental Representative.

3.5 FIELD QUALITY CONTROL

- .1 Required Pile Testing
 - .1 Each pile shall be driven to the refusal criteria and elevations outlined on the drawings.
 - .2 The depth to refusal of each pile shall be monitored and recorded to ensure piles are not obstructed during driving.

.3 A minimum of 10% of the piles installed shall be re-tapped 24 hours after installation to ensure no relaxation has occurred. If any relaxation has occurred, notify a Departmental Representative.

.2 Measurement:

.1 Maintain accurate records of driving for each pile, including:

.1 Types 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.

.4 Numbers of blows per meter for entire length of pile and number of blows per 25 mm for last 300 mm.

.5 Final tip and cut-off elevations.

.6 Record pertinent information such as interruption of continuous driving or pile damage.

.7 Record elevations taken on adjacent piles before and after driving of each pile.

.2 Provide a *Departmental Representative* with three copies of any records.

3.6 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 31 61 13 - Pile Foundations, General Requirements.
- .3 Section 06 05 73 - Wood Treatment.

1.2 Measurement Procedures

- .1 Consider shoes, cap plates, straps and preservative treatment incidental to supply of piles.
- .2 A *Departmental Representative* will establish actual number and lengths of piles installed from driving records.
- .3 Measurements for piles: Piles will be measured in meters from the toe elevation to cut-off elevation at pile cap.
- .4 Load tests: in accordance with Section 31 61 13, Pile Foundations General Requirements.

1.3 References

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 123/A123M-[01], Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A 153/A153M-[01], Standard

Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.

.3 ASTM A 307-[00], Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile.

.2 Canadian Standards Association (CSA)

.1 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN3-O56-[M79(R2001)], Round Wood Piles (metric version).

.4 CSA-O80 Series-[97], Wood Preservation.

.1 CSA-O80.18-[97], Pressure Treated Piles and Timbers in Marine Construction.

1.4 Protection

.1 Avoid dropping, bruising or breaking of wood fibers.

.2 Avoid breaking surfaces of treated piles.

.3 Do not damage surfaces of treated piles below cutoff elevation.

.4 Treat cuts, breaks or abrasions on surfaces of treated piles, bolt holes and field cuts in accordance with CSA-O80 Series.

1.5 Waste Management and Disposal

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

.2 Collect and separate for disposal packaging materials for recycling in accordance with Waste Management Plan.

.3 Place materials defined as hazardous or toxic in designated containers.

- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Preservative treated wood must not be disposed of through incineration.
- .6 Preservative treated wood must not be disposed of with other materials destined for recycling or reuse.
- .7 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill as approved by a *Departmental Representative*.
- .8 Dispose of unused wood preservative material at official hazardous material collections site.
- .9 Unused preservative material may not be disposed of into sewer system, into streams, lakes, onto ground or in any other location where they will pose a health or environmental hazard.

PART 2 - PRODUCTS

2.1 Materials

- .1 Round wood piles: to CAN3-056, with maximum butt size of 33 cm and minimum tip diameter of 20 cm. Pile lengths to be determined by a *Departmental Representative*.
- .2 Type of peeling: Douglas Fir species.
- .3 Pile species: Douglas Fir.
- .4 Brace timbers: pressure treated in accordance with Section 06 05 73 - Wood Treatment.
- .5 Preservative Treatment: to CSA 080.18-M89 Pressure Treated Piles and Timbers in Marine

- .6 A *Departmental Representative* will be the sole judge of quality and dimension of piles. Remove rejected piles from site of Work.
- .7 Wire nails, spikes, staples: to CSA B111.
- .8 Bolts, nuts and washers: to ASTM A 307.
- .9 Hot dip galvanize bolts, nuts and washers and unless otherwise specified, staples, cable clamps, pipe sleeves, spikes and nails to CAN/CSA-G164 [ASTM A 153/A153M]. Other hardware to be galvanized to ASTM A 123/A123M.

PART 3 - EXECUTION

3.1 Wood Preservation

- .1 Treat wood piles with wood preservative treatment as specified Section 06 05 73 - Wood Treatment.

3.2 Preparation

- .1 Select piles in each bent for uniformity of size and straightness to facilitate placing of brace timbers.
- .2 Submit details of proposed method of pile head and toe protection during driving to A *Departmental Representative* for review.

3.3 Installation

- .1 Install piles in accordance with Section 31 61 13 - Pile Foundations, General Requirements.
- .2 During driving restrain lateral movement of

piling at intervals not exceeding 5 meters over length between ground surface and driving head.

- .3 Treat exposed ends of cut off piles with two liberally brushed coats of wood preservative treatment as specified Section 06 05 73 - Wood Treatment. Allow sufficient interval between applications to permit total absorption.
- .4 Protection: treat end cut-offs and bolt holes with preservative.

<u>3.4 Pile Caps</u>	.1	Install concrete pile caps as indicated.
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<u>3.5 Bracing</u>	.1	Install bracing as indicated.
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<u>3.6 Splices</u>	.1	Not permitted.
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PART 1 - GENERAL

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|-----------------------------------|-----|--|
| <u>1.1 Related Sections</u> | .1 | Section 02 41 13 Selective Site Demolition. |
| <u>1.2 Measurement Procedures</u> | .1 | Removal of material located below water line shall be included in unit price for dredging. |
| | .2 | Removal of obstructions, authorized by a <i>Departmental Representative</i> will be included in the unit price for dredging. |
| | .3 | All operations in connection with field positioning of dredging equipment will not be measured separately for payment. |
| | .4 | No separate payment will be made for Contractor's survey vessel, equipment and crew or diving services. |
| | .5 | Payment will include disposal of dredge material, at locations specified. |
| | .6 | Payment will include disposal of contaminated dredge material to appropriate contaminated soil disposal facility as approved by the Departmental Representative. |
| | .7 | There will be no additional payment for delays incurred during periods when no dredging is permitted. |
| | .8 | There will be no additional payment for downtime and for delays caused by vessel traffic. |
| | .9 | Removal of infilling material will not be measured for payment. |
| | .10 | Mobilization and demobilization of all |

equipment including dredging equipment, to be included in the unit price (\$/cubic meter).

- .11 Change in location of disposal site. Base contract unit price on location of disposal site. Unit price will be adjusted up or down, subject to prior negotiation with a *Departmental Representative* for significant change in location of disposal site.
- .12 No separate payment will be made for sweeping.

1.3 Definitions

- .1 Dredging: excavating, transporting and disposing of underwater materials.
- .2 Class B material: loose or shale rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris.
- .3 Obstructions: material other than class B.
- .4 Debris: pieces of wood, wire rope, scrap steel, pieces of concrete and other waste materials.
- .5 Grade: plane above which material is to be dredged.
- .6 Sub-grade: plane parallel to and [300] mm below grade.
- .7 Estimated quantity: Volume of material calculated to be above sub-grade and within specified side slopes unless otherwise specified.
- .8 Side slope: inclined surface or plane from subgrade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.

- .9 Chart Datum: permanently established plane from which soundings or tide heights are referenced, usually Lowest Normal Tide (L.N.T.).
- .10 Coordinates:
 - .1 U.T.M.: universal transverse Mercator projection.
 - .2 M.T.M.: modified transverse Mercator projection.
 - .3 U.T.M. or M.T.M. Coordinates: plane rectangular coordinates used in grid system in which grid network is applied to U.T.M. or M.T.M. projection. Horizontal control information as indicated.
- .11 Minimum Mode: mode of operation of hydrographic survey equipment where minimum sounding over length of travel between position updates will be retained in memory. Soundings taken in this mode may be shallower than actual bottom elevations due to variations in water depths due to wave action.
- .12 Matrix Block: each dredge area is presented as number of [1.2 x 3.0] m long blocks. Dependent on position of sounding, block may have [0 to 4] soundings contained within it.
- .13 Least of Minimum Plan: hydrographic survey plan in which least sounding in grouping of matrix blocks is plotted.
- .14 Instantaneous Mode: mode of operation of hydrographic survey equipment where only sounding observed at predetermined distance interval is retained in memory.
- .15 Average of Instantaneous Plan: hydrographic survey plan in which average sounding in appropriate grouping of matrix blocks is plotted.
- .16 Lowest Normal Tide (L.N.T.): plane so low that tide will seldom fall below it.

- .17 Cleared Area: area of dredging accepted as complying with plans and specifications.

1.4 Submittals

1.5 Regulatory Requirements

- .1 Comply with municipal, provincial and national codes and regulations relating to project.

1.6 Waste Management and Disposal

- .1 Contaminated sediments must be disposed of in appropriate disposal facility.
- .2 Metals, wood and recyclable materials removed during the dredging activities must be diverted to appropriate recycling facilities.

1.7 Scheduling

- .1 Submit to a *Departmental Representative* within 2 weeks after award of contract, schedule of work including time periods during which each operation involved in Work will be undertaken. At time of submission of schedule, meet with a *Departmental Representative* to review schedule.
- .2 Adhere to schedule and take immediate action to correct any slippage by effectively altering existing dredging operations or mobilizing other equipment. Notify a *Departmental Representative* of corrective action to be taken.

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| <u>1.8 Location</u> | .1 | Work comprises excavation, dredging of areas as indicated. |
| <u>1.9 Interference to Navigation</u> | .1 | Be familiar with vessel movements and fishery activities in area affected by dredging operations. Plan and execute work in manner that will not interfere with fishing operations, marina operations, construction activities at wharf sites, or access to wharves by land or water. |
| | .2 | A <i>Departmental Representative</i> will not be responsible for loss of time, equipment, material or any other cost related to interference with moored vessels in harbour or due to other Contractor's operations. |
| | .3 | Keep District Manager, Canadian Coast Guard, Fisheries and Oceans, informed of dredging operations in order that necessary Notices to Mariners will be issued. |
| <u>1.10 Datum, Water Gauges and Targets</u> | .1 | Elevations used in this specification and contract drawings are in meters referred to chart datum. |
| | .2 | Areas to be dredged are to be referenced to vertical bench marks for each location of dredging as indicated. |
| <u>1.12 Inspection of Site</u> | .1 | Contractor to visit site of Work and become thoroughly familiar with extent and nature of Work and conditions affecting Work before tendering. |
| <u>1.13 Site Information</u> | .1 | Results of prior soundings and geotechnical investigations are available for inspection upon request. |
| | .2 | Results of prior soundings and geotechnical |

investigations are made available for tendering purposes only. It should be noted that this information may differ from site condition. Take this into consideration when submitting tender.

- .3 Borehole descriptions are provided to give description of underlying soils only.
- .4 Take necessary steps to become fully familiar with potential inclement weather and sea conditions in this area.

1.14 Survey Requirements

- .1 Provide, at own expense, equipment and crew to set up and maintain control for location of dredge limits and to sound areas immediately before and after dredging to verify that grade depth has been attained. Areas are to be sounded to provide sounding printout display of at least 3m x 3m grid to approval of a *Departmental Representative*.

1.15 Surveys and Acceptance of Work

- .1 No area will be dredged prior to a *Departmental Representative* and Contractor's mutual acceptance of pre-dredge survey for that area.
- .2 Post-dredge surveys will be undertaken by the Contractor upon completion of dredging. Survey will confirm if dredging is completed as specified and whether area can be considered cleared area.
- .3 Contractor to re-dredge as necessary to remove all material within dredge areas which is found to be above grade.
- .4 Additional surveys required to clear areas will be undertaken by the Contractor at the contractor's cost.

PART 2 - PRODUCTS

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| 2.1 Dredging
<u>Equipment</u> | .1 | Contractor to determine required equipment necessary to dredge material specified and to dispose of dredged material at appropriate locations. |
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PART 3 - EXECUTION

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|-------------|----|--|
| 3.1 General | .1 | Mark floating equipment with lights in accordance with International Rules of Road and maintain radio watch on board. |
| | .2 | Place and maintain buoys, markers and lights required to define work and disposal areas. |
| | .3 | Lay out Work from bench marks and base lines established by a <i>Departmental Representative</i> . Be responsible for accuracy of Work relative to established bench marks and baseline. Provide and maintain electronic position fixing and distance measuring equipment, laser transits and such other equipment as normally required for accurate dredging control. |
| | .4 | Establish and maintain tide boards in order that proper depth of dredging can be determined. Locate gauges tide boards so as to be clearly visible. |
| | .5 | Establish and maintain on-land targets for location and definition of designated dredge area limits. Targets to be suitable for control of dredging operations and locating soundings. Remove targets on completion of Work. |

- .6 Dredge side slopes to a four horizontal to one vertical.
- .7 Remove materials above specified grade depths, within limits indicated. Material removed from below subgrade depth or outside specified area or side slope is not part of Work.
- .8 Remove shoaling which occurs as results of work at no additional expense.
- .9 Remove materials cast-over on surrounding area and dispose of it as dredged material. Do not cast-over material unless authorized by a *Departmental Representative*.
- .10 Remove infilling in dredge areas which occurs prior to acceptance by a *Departmental Representative*.
- .11 Immediately notify *Departmental Representative* upon encountering object which might be classified as obstruction. By-pass objects after clearly marking its location and continue work.

3.2 Disposal of Dredged Material

- .1 Dispose of dredged material by depositing in appropriate disposal areas in manner approved by a *Departmental Representative*.

3.3 Sweeping

- .1 Sweep dredged areas on completion of dredging to confirm that grade depth has been achieved.
- .2 Sweeping equipment to consist of heavy steel beam suspended from scow at required grade depth. Beam to be capable of adjustment and calibration and approved by a *Departmental Representative*.



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- .3 If, as result of incomplete Work, additional verification of depths by sounding or sweeping becomes necessary, additional costs involved shall be paid by Contractor.

- 3.4 Re-dredging .1 Re-dredge unsatisfactory Work and verify depths with additional sounding or sweeping to approval of a *Departmental Representative*.

- 3.5 Co-operation and Assistance to a *Departmental Representative* .1 Co-operate with a *Departmental Representative* on inspection of Work and provide assistance requested.
- .2 On request of a *Departmental Representative*, furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and supervise Work.

PART 1 - GENERAL

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| <u>1.1 Related Sections</u> | .1 | Section 01 33 00 - Submittal Procedures. |
| | .2 | Section 01 74 21 - Construction/Demolition Waste Management And Disposal. |
| <u>1.2 Measurement Procedures</u> | .1 | Mooring cleats: Shall be based on a price per mooring cleat. |
| <u>1.3 References</u> | .1 | American Society for Testing and Materials (ASTM) |
| | .1 | ASTM A 27/A27M-[95], Standard Specification for Steel Castings, Carbon, for General Application. |
| | .2 | ASTM A 48/A148M-[01], Standard Specification for Steel Castings, High-Strength, for Structural Purposes. |
| | .2 | Canadian General Standards Board (CGSB) |
| | .1 | CAN/CGSB-1.61-[99], Exterior and Interior Marine Alkyd Enamel. |
| | .2 | CAN/CGSB-1.212-[95], Chromate and Lead Free Marine Primer for Steel and Light Alloy Surfaces. |
| | .3 | Canadian Standards Association (CSA) |
| | .1 | CSA G40.20/G40.21-[98(June 2000)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel. |
| | .2 | CSA C22.1SB-[98], Canadian Electrical Code, Part 1 (18th Edition), Safety Standard for Electrical Installations (Spiral-bound). |

<u>1.4 Shop Drawings</u>	.1 Provide manufacturer's shop drawings to a Departmental representative before installation.
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<u>1.5 Closeout Submittals</u>	Not Applicable
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<u>1.6 Waste Management and Disposal</u>	.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
	.2 Collect and separate for disposal any packaging material for recycling in accordance with Waste Management Plan.
	.3 Divert unused metal materials from landfill to metal recycling facility as approved by a <i>Departmental Representative</i> .
	.4 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by a <i>Departmental Representative</i> .
	.5 Fold up metal banding, flatten and place in designated area for recycling.
	.6 Unused paint material must not be disposed of into sewer system, into streams, lakes, onto ground or in any other location where they will pose a health or environmental hazard.

<u>1.7 Environmental Requirements</u>	.1 Provide proper protection for a marine environment.
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| <u>2.1 Materials</u> | .1 | Mooring cleats assemblies: <ul style="list-style-type: none">.2 Mooring cleats: cast steel to ASTM A 148/A148M, grade 80-50..3 Base plate: cast steel to ASTM A 27/A27M, grade N-2..4 Other metal parts: structural steel to CSA G40.21. |
| | .2 | Paint: <ul style="list-style-type: none">.1 Shop prime coat: to CAN/CGSB-1.212 MPI #79.2 Two finish coats: to CAN/CGSB-1.61 MPI], colour as directed by a <i>Departmental Representative</i>. |
| | .3 | Grout: shrinkage compensating non-metallic. |

PART 3 - EXECUTION

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| <u>3.1 Workmanship</u> | .1 | Install mooring cleats in accordance with manufacturer's instructions. |
| <u>3.2 Setting and Grouting</u> | .1 | Set all mooring cleats at locations and elevations as indicated. <ul style="list-style-type: none">.1 After tightening of anchor bolts or positioning wedges, grout under base as required to fill void between the cleat and the concrete deck panel..2 Ensure that temperatures of foundation, air, base and grout are within range specified by grout manufacturer. |

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3.3 Acceptance .1 A *Departmental Representative* is solely responsible for the approval of all mooring cleats.